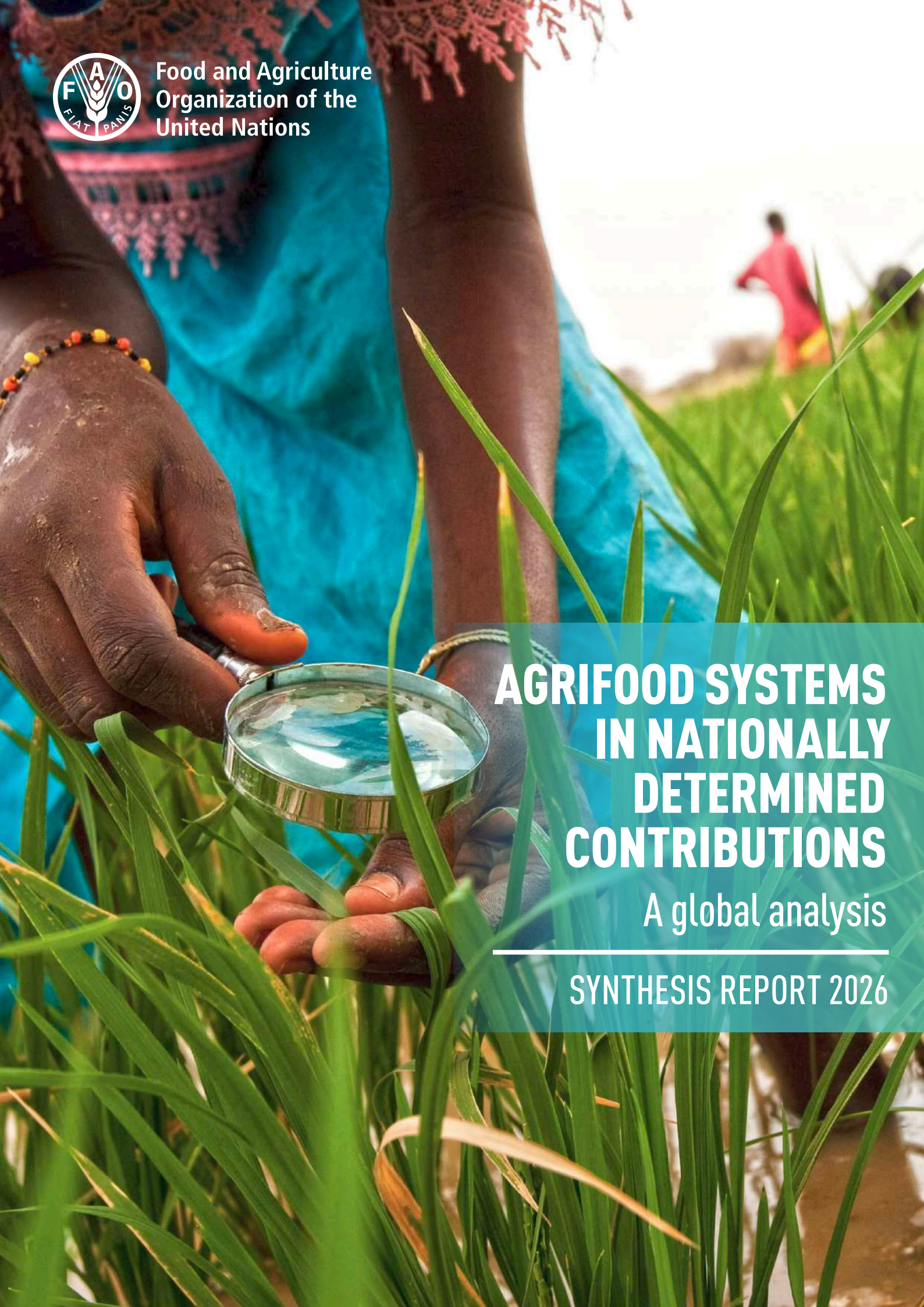


Food and Agriculture Organization of the United Nations

AGRIFOOD SYSTEMS IN NATIONALLY DETERMINED CONTRIBUTIONS

A global analysis

SYNTHESIS REPORT 2026



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BY

Krystal Crumpler, Maria Haensel, Aleksandra Wybieralska, Paolo Prosperi, Giulia Margiotta, Julie Hanot, Ilaria Caputo, Simon Addison, Ivano Assenza, Mario Bloise, Oriane Bron, Gala Dahlet, Marcell Farkas, Huzaifa Fazal, Giulia Galbiati, Padmini Gopal, MinAh Kim, Gabriela Kolpak, Anastasia Kvasha, Francesco Londono, Elena Marchetti, Julian Mashingaidze, Shun Mitamura, Runyararo Munondo, Emily Perperidis,Marcos Preti, Mirella Salvatore, Beatriz Sanchez, Laure-Sophie Schiettecatte, Hyeongjin Song, Emily Tanganelli, Viviane Umulisa, Oriane Turot, Thanh Van Nguyen, Tamara Vant Wout, Veljko Vorkapic, Xiaoxiao Wang, Huimin Zhang, Manuela Zindler, Julia Wolf, Irini Maltsoglou and Martial Bernoux

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ABBREVIATIONS

AFOLU	agriculture, forestry and other land use
BAU	business as usual
BTR	biennial transparency report
CMIP	Coupled Model Intercomparison Project
CPI	Climate Policy Initiative
CTF	common tabular format
GHG	greenhouse gas
IPCC	Intergovernmental Panel on Climate Change
LDC	least developed country
LULUCF	land use, land-use change and forestry
NDC	nationally determined contribution
SIDS	Small Island Developing States
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States dollar
WASH	water, sanitation and hygiene

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KEY FINDINGS

Agrifood systems and food security are increasingly central to countries' priorities for addressing climate change.

- Around 9 out of 10 countries report climate impacts on agrifood systems and food security (86 percent) in their latest NDCs, and they are continuing to prioritize adaptation and/or mitigation actions (93 percent) in the sector.

Countries are setting higher emission reduction targets through agriculture and land use sectors.

- The latest NDCs aim to bring greenhouse gas (GHG) emissions from agriculture, forestry and other land use in 2035 to levels 9 percent below those targeted for 2030 in the previous round of NDCs.
- If all conditional elements are met, emissions from these sectors are projected to fall by 41 percent in 2030 and 76 percent in 2035, compared to 2019 levels.

Mitigation ambition is rising, but proposed actions fall short of pledged targets.

- Among the 15 highest agrifood system emitters, proposed mitigation actions would deliver only 19 percent of the pledged net emission reduction. This leaves an 81 percent mitigation gap between targets and the actions they have identified.
- In agriculture, the mitigation gap for all countries stands at 48 percent. The largest shortfalls are in enteric fermentation, direct nitrous oxide (N2O) emissions from managed soils (e.g. fertilizer application), rice cultivation and manure management.
- In the land use, land use change and forestry sector, the mitigation gap reaches 70 percent, with the largest shortfalls in emissions from croplands, forest lands and grasslands.

Climate impacts on agrifood systems and vulnerable groups may be outpacing what is planned for adaptation.

- Most countries (75 percent) of countries recognize some groups, particularly smallholders, women, youth, Indigenous Peoples and migrants in agrifood systems and rural areas are disproportionately vulnerable to climate impacts. However, few adaptation actions (20 percent) planned in agrifood systems explicitly address their specific vulnerabilities, capacities and needs.
- Similarly, adaptation actions do not always match up against the the climate hazards identified. Almost all countries (86 percent) report climate hazards and corresponding impacts on agrifood systems, but only about a fifth of proposed agrifood adaptation actions are designed explicitly to address them. This matters because different hazards require different adaptation responses.

Loss and damage in agrifood systems is on the rise, with reporting going up by 50 percent in the latest NDCs.

- Nearly two-thirds of all countries (63 percent) are reporting loss and damage in agrifood systems in their latest NDCs, with a focus on economic losses from extreme events, such as production, income and asset losses over those arising from slow-onset processes and beyond the farm gate, including food security and cultural heritage losses.

Systems for monitoring adaptation progress in food and agriculture are improving. But focus is still on tracking activities rather than measuring results.

- Monitoring coverage is expanding, but systems remain underdeveloped. Over half of NDCs (57 percent) now include indicators for tracking adaptation in food and agriculture, but only one-third of countries report having national monitoring, evaluation and learning systems in place.
- The larger gap lies in what is being measured. More than 40 percent of the indicators set forth track adaptation outputs, such as number of farmers trained or hectares under agroforestry. But only about one-quarter of indicators measure actual changes in adaptation outcomes and impacts on resilience – whether investments have reduced crop losses or buffered food production systems against a flood, strengthened livelihoods or sustained food security levels.

Climate finance flows towards agrifood systems are not keeping pace with increasing needs and escalating risks.

- Overall, climate finance needs estimated in the latest NDCs increased by 70 percent compared to the previous round, and they account for 18 percent of total finance needs expressed across all sectors.
- However, the crop, livestock, forestry and fisheries production sectors received just 5 percent of climate-related development finance flows in 2024, and those flows continue to decline – falling 10 percent compared to the previous year.

1. INTRODUCTION

Agrifood systems are central to climate action and food security. The impacts of climate change on agriculture and food systems are already severe and widespread, threatening to reverse progress made on ending hunger, malnutrition and extreme poverty (FAO, 2015; Intergovernmental Panel on Climate Change [IPCC], 2022). At the same time, agrifood systems contribute significantly to global anthropogenic greenhouse gas emissions (FAO, 2025). Understanding how countries address agrifood systems in their nationally determined contributions (NDCs) is essential to assessing their climate priorities and planned responses to these interconnected challenges. However, commitments alone are not sufficient to deliver meaningful change. Translating them into action requires coherent, evidence-based and adequately financed implementation strategies that strengthen resilience, address climate risks, reduce emissions, and ultimately safeguard food security and nutrition.

This synthesis draws on the full report, *Agrifood systems in nationally determined contributions: A global analysis* (forthcoming), which analyses how countries address agrifood systems in the third round of NDCs. It brings together the main findings of the analysis, highlighting countries' priorities and commitments, persistent planning gaps, and the actions and enabling conditions needed to translate commitments into implementation.

1.1 BACKGROUND: THE PARIS AGREEMENT AND THE ROLE OF NDCs

In 2015, Parties from developed and developing nations alike committed to addressing climate change under the landmark Paris Agreement. The Agreement established three overarching goals: to pursue efforts to limit global warming to 1.5 °C above pre-industrial levels; to enhance adaptive capacity and resilience to climate change; and to make financial flows consistent with low-emission, climate-resilient development pathways (United Nations Framework Convention on Climate Change [UNFCCC], 2015). Article 4 of the Agreement requires all Parties to prepare, communicate and maintain successive NDCs, setting out their planned climate actions and reflecting their highest possible ambition. Parties are required to communicate successive NDCs every five years to the UNFCCC, with each successive contribution expected to represent a progression beyond the previous one as part of the Paris Agreement's ambition-raising mechanism.

1.2 CONTEXT SETTING: AGRIFOOD SYSTEMS AT THE FOREFRONT OF THE CLIMATE CRISIS AND ITS SOLUTION

Climate change is already adversely affecting crops, livestock, forestry, fisheries and aquaculture and will place increasing pressure on all components of agrifood systems, threatening food security and livelihoods (Campbell, 2022). Increasing weather and climate extreme events have already exposed millions of people to acute food insecurity and reduced water security, with the largest adverse

impacts observed in Africa, Asia, Central and South America, least developed countries (LDCs), Small Island Developing States (SIDS) and the Arctic, with disproportionate impacts on Indigenous Peoples, small-scale food producers and low-income households (IPCC, 2023). By mid-century, 10 percent of currently suitable agricultural land could become climatically unsuitable under high-emissions scenarios (Bezner Kerr *et al.*, 2022), and climate change could place up to 80 million additional people at risk of hunger (Bezner Kerr *et al.*, 2022) on top of the 87.5 million that already faced high levels of food insecurity due to climate extremes in 2025 (FAO, World Food Programme and Global Network Against Food Crises, 2026). Around half of the global population already experiences severe water scarcity for part of the year (IPCC, 2023), while irreversible ecosystem losses are undermining essential services to agrifood systems (IPCC, 2023).

The heaviest burdens fall on people already facing poverty, limited access to basic services and resources and governance challenges – especially women, youth, older people, ethnic and religious minorities, Indigenous Peoples, refugees and populations dependent on climate-sensitive livelihoods (e.g. smallholder farmers, pastoralists, fishing communities) (Birkmann *et al.*, 2022). Climate impacts intersect with existing inequalities and vulnerability levels, resulting in reduced capacities for adaptive responses and often limited participation in decision-making (Birkmann *et al.*, 2022). The IPCC finds that climate change has caused widespread adverse impacts and related losses and damages that are unequally distributed across systems, regions and sectors, including economic losses detected in the agriculture sector and increased food insecurity (Birkmann *et al.*, 2022). There is evidence that, even with effective adaptation, losses and damages will continue to affect the poorest vulnerable populations (Birkmann *et al.*, 2022), posing a particularly significant risk to those living in rural areas and dependent on subsistence agriculture where the greatest concentration of the extreme poor resides (FAO, 2017). An estimated 132 million more people may fall into extreme poverty by 2030 due to climate change, largely through impacts on agriculture and higher food prices (Jafino *et al.*, 2020). Smallholder farmers, who produce one-third of the world's food and depend heavily on weather-sensitive livelihoods, must therefore be central to adaptation and climate action (Lowder *et al.*, 2021).

Reducing the emissions intensity of agricultural production, enhancing carbon sequestration in biomass and soils, and reducing emissions along pre- and post-production value chains can significantly reduce emissions from agrifood systems, which account for 30 percent of global greenhouse gas (GHG) emissions each year (FAO, 2025). The latest climate science shows how solutions on land, forests, and waters can deliver on climate and food security at the same time. For example, agroforestry can increase soil carbon in top soil by up to 40 percent, while improving resilience against floods and droughts, and in some cases improving profitability by up to four times (Milne *et al.*, 2025). Greater conservation, restoration and sustainable management of the world's forests, wetlands, grasslands and agricultural lands is regarded as one of the most cost-effective natural solutions to climate change – equivalent to one-third of the global solution – while strengthening ecosystem and community resilience (Griscom *et al.*, 2017). Sustainable aquatic food systems are also critical: the ocean has absorbed about 23 percent of anthropogenic carbon emissions over the past 60 years and more than 90 percent of excess heat since the 1970s (IPCC, 2021). Integrating climate action into inclusive policies on agriculture, food security, poverty reduction and rural development can make these efforts more effective and lasting.

FAO recognizes that climate change threatens progress towards the goals of eradicating hunger, food insecurity and malnutrition, reducing rural poverty, and making agriculture, forestry and fisheries more productive and sustainable. FAO has committed to strengthening its support to Members on climate action, as set out in the FAO Strategy on Climate Change 2022–2031 (FAO, 2022) and its Action Plan (FAO, 2026). The strategy is structured around three pillars: strengthening climate policy and governance at global and regional levels; enhancing countries' capacities to plan and implement climate action; and scaling up climate action on the ground at the local level. NDCs provide an important framework for understanding countries' climate priorities and planned actions in agrifood systems. Since the first round of NDCs, FAO has conducted a series of analyses synthesizing

information on countries' climate change priorities and needs in agrifood systems. This body of analytical work provides an important evidence base for informing policies, programmes, investments and support for climate-resilient, low-emission agrifood system transformation.

1.3 ANALYTICAL APPROACH: PURPOSE, METHODS AND DATA

This synthesis report summarizes how agrifood systems feature in national climate plans, based on a review of the latest available NDC submissions by developing and developed countries under the Paris Agreement. It presents information on countries' climate change targets, priorities and needs related to agrifood systems and assesses changes in climate action ambition over time, pointing to gaps and opportunities for strengthened NDC planning and implementation processes. The findings aim to support national policy makers, climate action practitioners, development partners and climate negotiators in aligning national climate plans and actions with the goals of the Paris Agreement and the broader climate-resilient sustainable development agenda. The synthesis focuses on the main findings of the analysis, illustrating key trends, commitments, gaps and priorities for action, while further details on the methodology and results are provided in the full technical report, which will be published separately.

The analysis is based on a systematic review of the latest versions of 167 NDC documents submitted to the UNFCCC, representing 194 Parties (including the European Union) and 193 countries, as of 30 April 2026. The "latest" NDCs are referred to as "NDC 3.0" documents because they represent the latest available version during the current third-round NDC submission cycle. The "previous" NDCs ("NDC 2.0") are defined as the latest available documents submitted as of 31 December 2023, during the second-round NDC cycle. At the time of analysis, 108 countries had submitted a new or updated NDC during the third-round NDC cycle since the submission of a previous NDC in the second-round NDC cycle. The trends presented are calculated using the number of NDCs for each variable out of the 167 NDCs available at the time of analysis. This distinction is important when interpreting changes in the coverage and ambition of agrifood-related climate action over time, as the analytical approach adopted compares the "state" of ambition in agrifood systems for all countries (n=167 NDCs) at two points in time: at the time of the NDC 2.0 cycle versus the time of the NDC 3.0 cycle. The approach, therefore, does not focus on the subset of countries (n=108 NDCs) with both NDC 2.0 and 3.0 cycles available for comparison. This analytical choice was adopted for several reasons: (i) to ensure global representation and comparability over time; (ii) to avoid subjective interpretation of inconsistencies between country-defined NDC document versions and UNFCCC-labelled versions in the NDC Registry; and (iii) to avoid interpreting the soft and hard NDC submission deadlines communicated by the UNFCCC and the use of flexibility mechanisms for developing countries. For ease of reference, the text and figures generally refer to the resulting proportions as the "share of countries". Where an analysis is based on a subset of NDCs, this is indicated accordingly.

Each NDC was reviewed against FAO's protocol for extracting and analyzing information on agrifood systems. The analysis adopts FAO's definition of agrifood systems (FAO, 2021) and includes "supporting systems" within its scope. These comprise surrounding ecosystems and biodiversity that provide critical services to food and agriculture, as well as rural areas that are home to populations closely tied to agrifood systems. For the analysis of GHG emissions, it draws on the sectoral classifications established by the IPCC (2006) for agriculture and land use, land-use change and forestry (LULUCF), collectively referred to as agriculture, forestry and other land use (AFOLU), as well as FAO's framework for estimating GHG emissions from agrifood systems (FAO, 2025). The full methodology will be described in the forthcoming full technical report.



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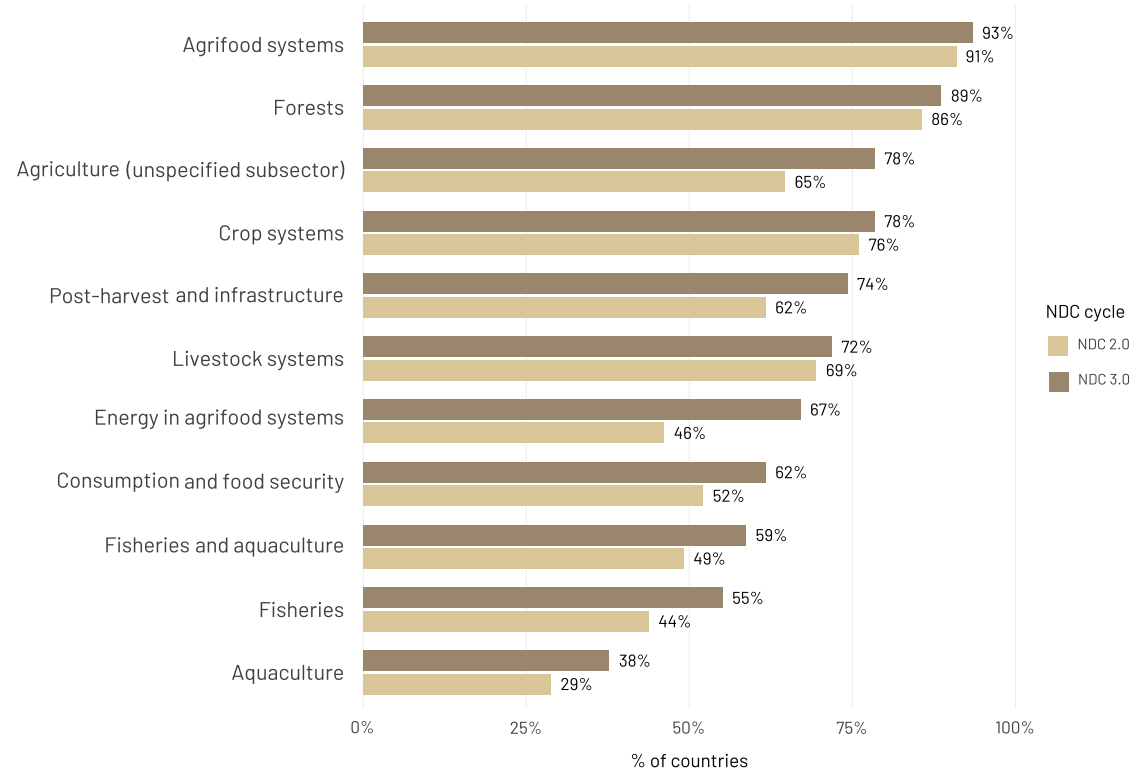
2. MAIN FINDINGS

2.1 AGRIFOOD SYSTEMS ARE INCREASINGLY CENTRAL TO CLIMATE PRIORITIES AS SOURCES OF SOLUTIONS AND AS SECTORS HIGHLY EXPOSED TO CLIMATE IMPACTS

No. 1 Agrifood systems feature in nearly all countries' climate commitments under the Paris Agreement, with growing attention across the value chain (93 percent, up from 91 percent in previous NDCs). Forests, crop and livestock systems remain among the main agrifood subsectors prioritized for adaptation and mitigation. Attention to post-harvest activities and consumption is also growing in response to cascading climate impacts and opportunities for mitigation along the value chain, including energy efficiency and sustainable bioenergy. Fisheries and aquaculture feature less prominently in adaptation and mitigation planning, but are increasingly prioritized, reflecting their importance for food security and livelihoods in rural economies and coastal communities (Figure1).

FIGURE 1

AGRIFOOD SYSTEMS PRIORITIZED FOR CLIMATE ACTION REPORTED IN NATIONALLY DETERMINED CONTRIBUTIONS, BY SUBSECTOR



Source: Authors' analysis of NDCs submitted as at 30 April 2026.

The most frequently prioritized agrifood climate solutions include forest restoration and conservation, irrigation and improved agricultural water management practices, agroforestry and mixed systems, the introduction of climate-tolerant crop varieties, soil and fertilizer management, improved animal feed, manure management and bioenergy generation from organic residues, among others. The sustainable use, conservation and restoration of ecosystems and biodiversity are also prominent in NDCs, reflecting the critical services they provide to food and agriculture, including carbon sequestration and resilience to climate hazards such as floods, droughts and storms. Solution areas also extend beyond production to promote on- and off-farm livelihood diversification, value addition and market development, the climate-proofing of physical infrastructure, networks and services for agrifood systems and people living in rural areas, and the empowerment of marginalized groups in decision-making (Figure 2).

FIGURE 2

TOP CLIMATE SOLUTIONS IN AGRIFOOD SYSTEMS PRIORITIZED IN NATIONALLY DETERMINED CONTRIBUTIONS, BY TYPE



Agrifood systems

Action category	% of countries
Afforestation, reforestation and forest restoration	81%
Forest conservation	75%
Irrigation and drainage in crop systems	56%
Agroforestry and tree crops	54%
Agricultural waste management	54%
Crop species/genetics	50%
Value addition and markets	46%
Soil and fertilizer management in agriculture	46%
Reduced deforestation and degradation	44%
Manure management and bioeconomy	37%
Livestock feed management	35%
Sustainable forest use and management	34%
Mixed systems with crops	34%
Bioenergy generation from organic waste and residues	33%
Fertilizer management in crop systems	32%



Ecosystems & biodiversity

Action category	% of countries
Terrestrial ecosystem sustainable use, conservation and/or restoration	91%
Freshwater ecosystem sustainable use, conservation and/or restoration	77%
Ocean/coastal ecosystem sustainable use, conservation and/or restoration	68%
Wetlands sustainable use, conservation and/or restoration	65%



Human systems & rural area

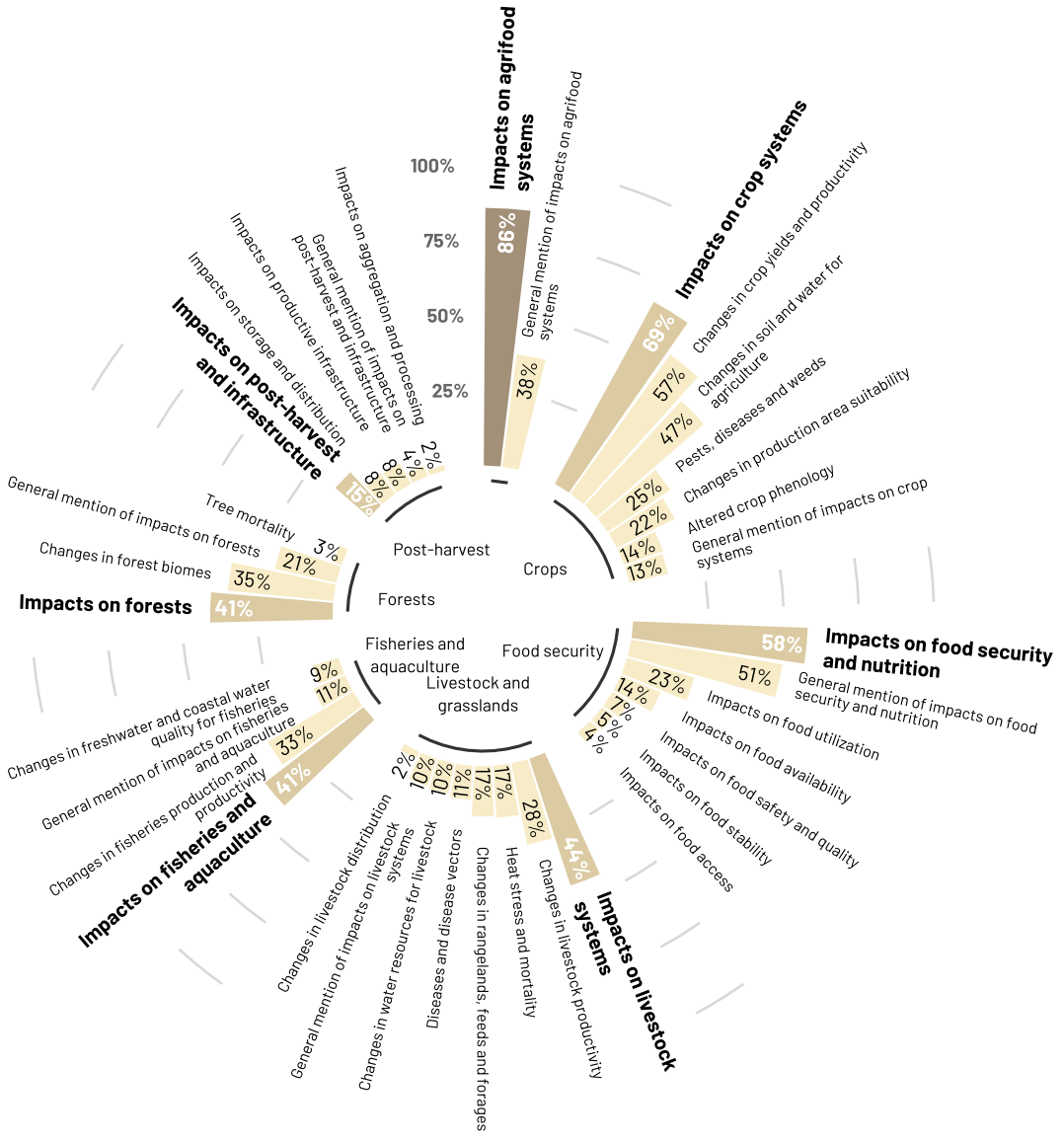
Action category	% of countries
WASH-related adaptation	53%
Climate-proofed physical infrastructure, networks and services	51%
On- and off-farm livelihood diversification	44%
Community-based adaptation	41%
Urban green/blue infrastructure	39%
Health strategies, policies and interventions	36%
Inclusive adoption of new technologies and practices	36%
Economic inclusion	36%
Flood risk reduction in rural areas	29%
Empowerment and participation in decision-making	29%

Source: Authors' analysis of latest NDCs submitted as at 30 April 2026. Note: WASH = water, sanitation and hygiene.

No. 2 Agrifood systems are on the front lines of climate impacts: more than eight in every ten countries report climate impacts on agrifood systems and food security outcomes in their latest NDCs (86 percent compared to 85 percent in previous NDCs). Impacts are both observed and projected across all agricultural production subsectors (Figure 3), including changes in productivity, changes in the quantity and quality of soil and water resources for production and increased incidence and intensity of pests, diseases and weeds, as well as impacts that travel along the agrifood value chain, such as market disruptions, post-harvest losses, diminished food quality, restrictions in food access and availability and reduced nutrient content. Countries also report climate impacts on the supporting systems (Figure 4, Figure 5, Figure 6 and Figure 7) that underpin food and agriculture, including surrounding ecosystems and biodiversity (82 percent compared to 87 percent) and health, livelihood and infrastructure systems in rural areas (78 percent compared to 73 percent) that are essential for adaptation and the resilience of agrifood systems.

FIGURE 3

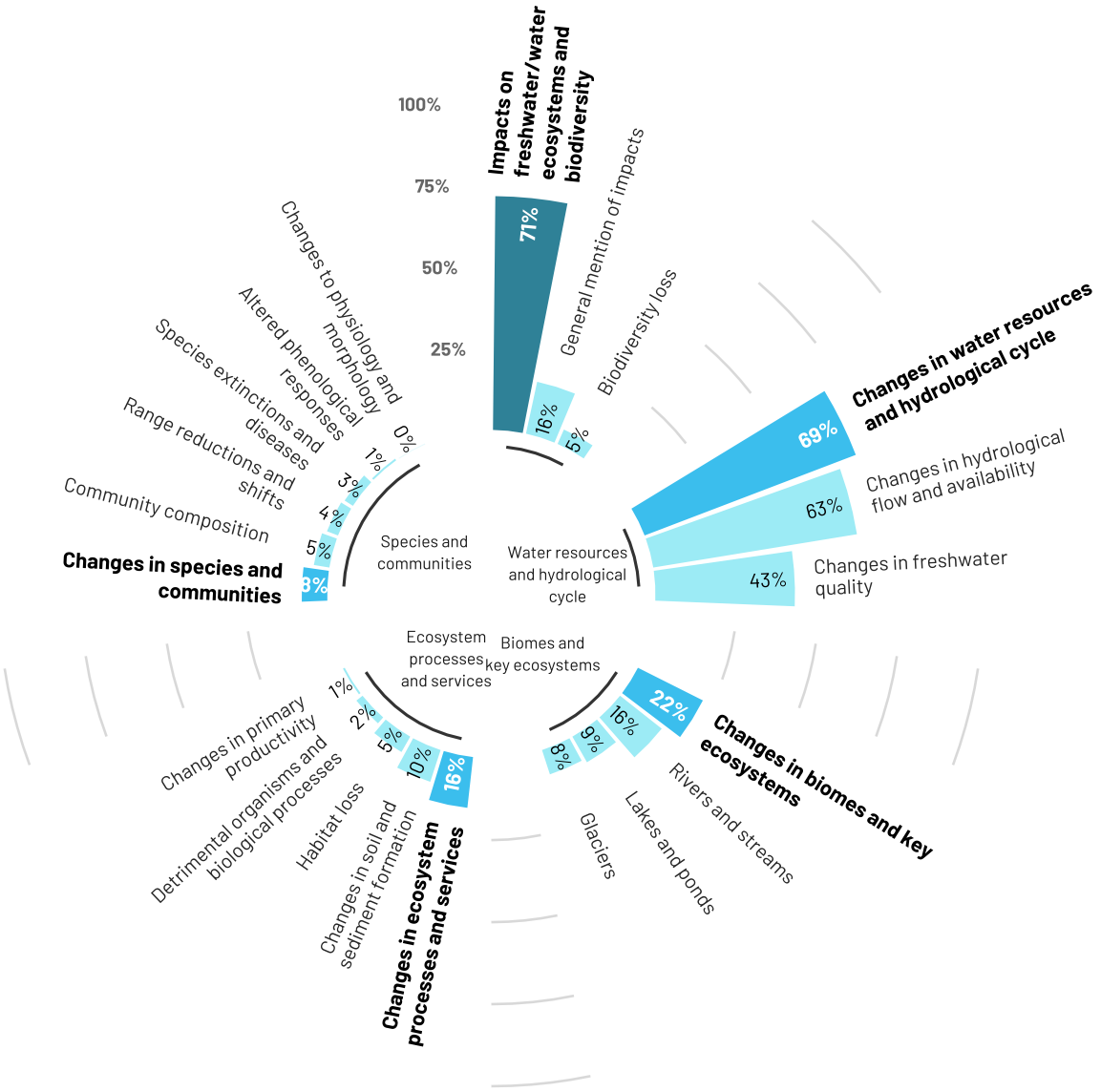
CLIMATE-RELATED IMPACTS ON AGRIFOOD SYSTEMS REPORTED IN NATIONALLY DETERMINED CONTRIBUTIONS, BY SUBSECTOR AND IMPACT TYPE



Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

FIGURE 4

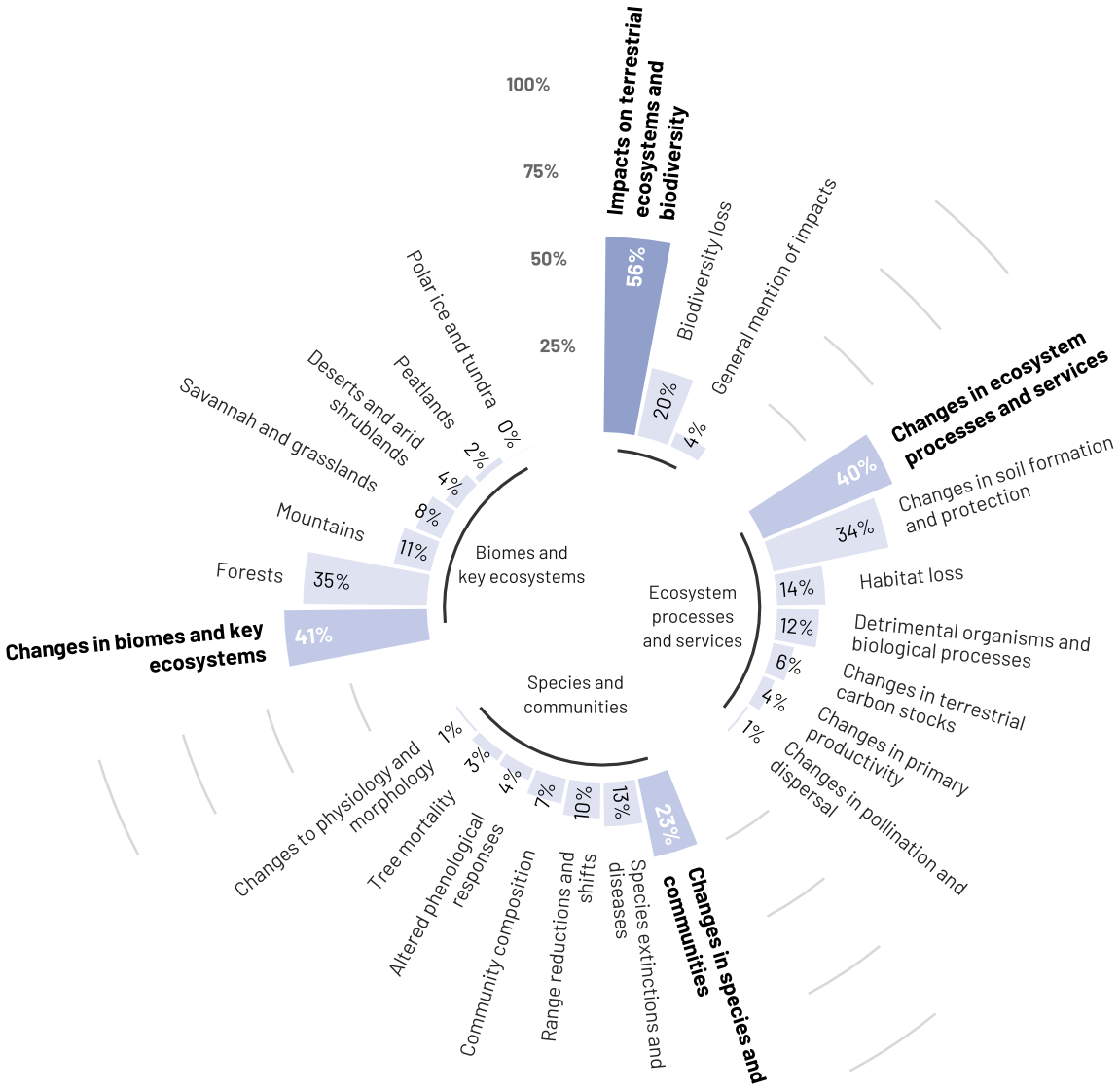
CLIMATE-RELATED IMPACTS ON FRESHWATER ECOSYSTEMS AND THEIR SERVICES (INCLUDING WATER) REPORTED IN NATIONALLY DETERMINED CONTRIBUTIONS, BY IMPACT TYPE



Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

FIGURE 5

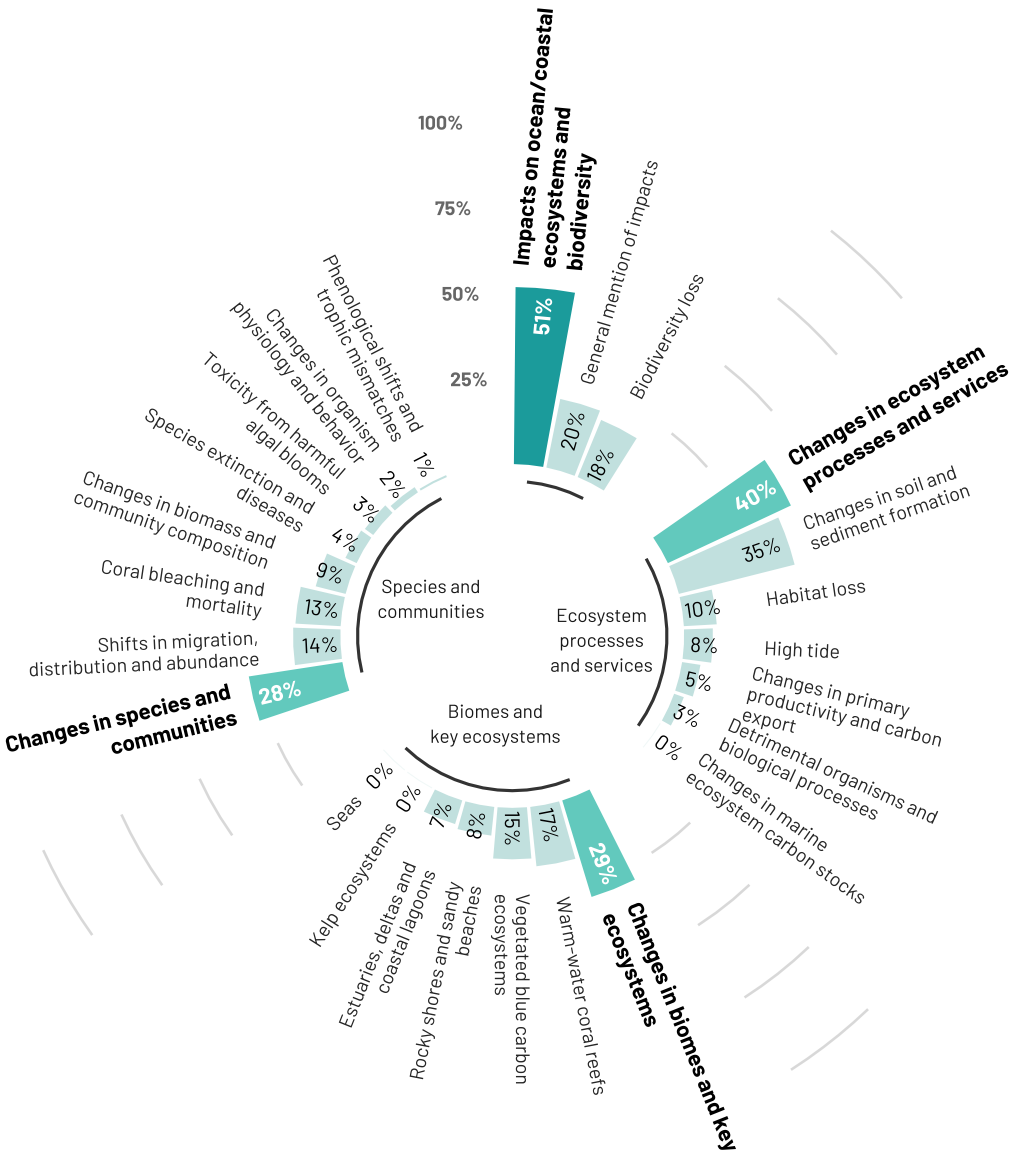
CLIMATE-RELATED IMPACTS ON TERRESTRIAL ECOSYSTEMS AND THEIR SERVICES REPORTED IN NATIONALLY DETERMINED CONTRIBUTIONS, BY IMPACT TYPE



Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

FIGURE 6

CLIMATE-RELATED IMPACTS ON OCEAN AND COASTAL ECOSYSTEMS AND THEIR SERVICES REPORTED IN NATIONALLY DETERMINED CONTRIBUTIONS, BY IMPACT TYPE



Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

FIGURE 7

CLIMATE-RELATED IMPACTS ON THE HUMAN DIMENSIONS OF AGRIFOOD SYSTEMS AND RURAL AREAS REPORTED IN NATIONALLY DETERMINED CONTRIBUTIONS, BY DIMENSION AND IMPACT TYPE

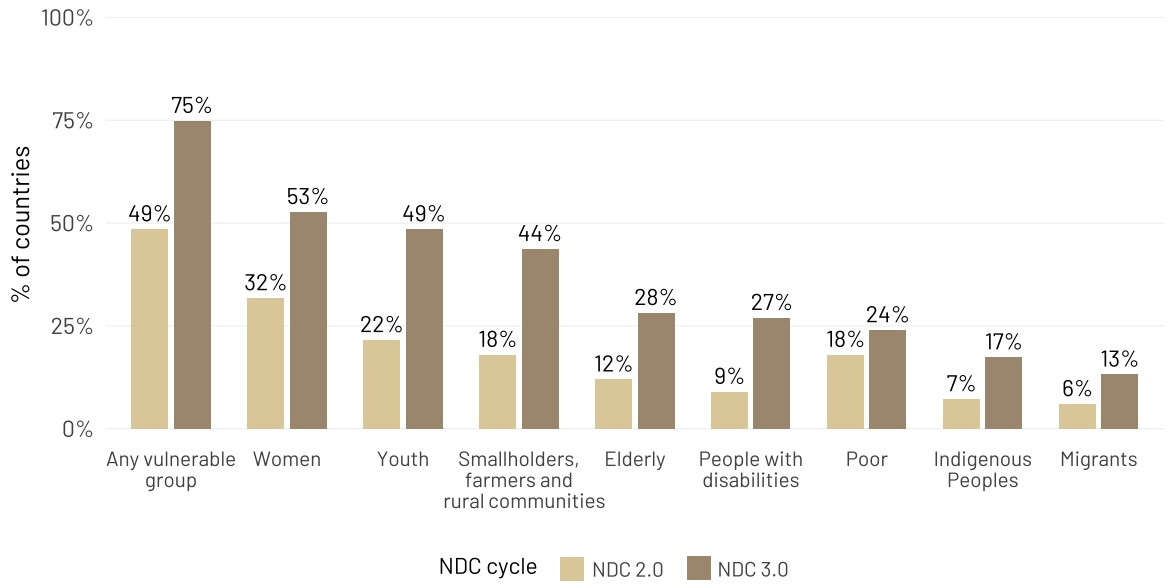


Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

No. 3 Climate-related impacts are disproportionately felt among vulnerable groups in agrifood systems and rural areas: 75 percent of countries report vulnerable groups in agrifood systems as disproportionately affected by climate impacts (compared to 49 percent in previous NDCs), with reporting of climate impacts increasing in every region and nearly doubling across some vulnerable groups, including smallholders, women, youth, Indigenous Peoples and migrants (Figure 8).

FIGURE 8

CLIMATE IMPACTS REPORTED ON VULNERABLE GROUPS IN AGRIFOOD SYSTEMS IN NATIONALLY DETERMINED CONTRIBUTIONS, BY GROUP

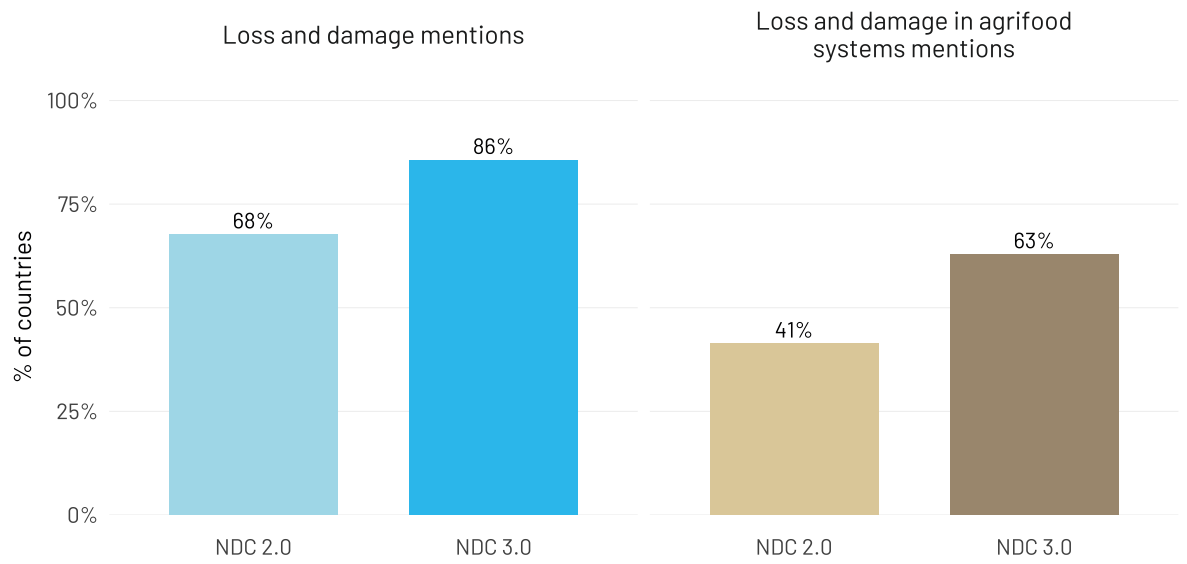


Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

No. 4 Loss and damage experienced in agrifood systems is also on the rise, with reporting going up by 50 percent in the latest round of NDCs, especially in SIDS, LDCs and developing countries (63 percent of countries globally, compared with 41 percent in previous NDCs) (Figure 9). Loss and damage reported in agrifood systems are driven by both extreme and slow-onset processes, and they generate both economic and non-economic losses and damages (59 and 54 percent of countries reporting, respectively). Economic losses reported entail losses in agricultural production and income and damage to productive assets and infrastructure, while reported non-economic losses are largely environmental. Less tangible losses at the individual or societal level – such as food insecurity, loss of life, human mobility, and loss of territory or cultural identity – are recognized but less frequently represented (Figure 10). Reported losses and damages are captured primarily at the production stage of the agrifood value chain, with less systematic coverage of losses during storage, processing, transport and distribution. The actions currently proposed focus on reducing risk, with measures to anticipate and address materialized losses and damages still emerging. These gaps are consistent with the known challenges of loss and damage assessment – with limited reporting on non-economic loss and damage, losses beyond production and those caused by slow onset processes, such as salinization or coastal erosion.

FIGURE 9

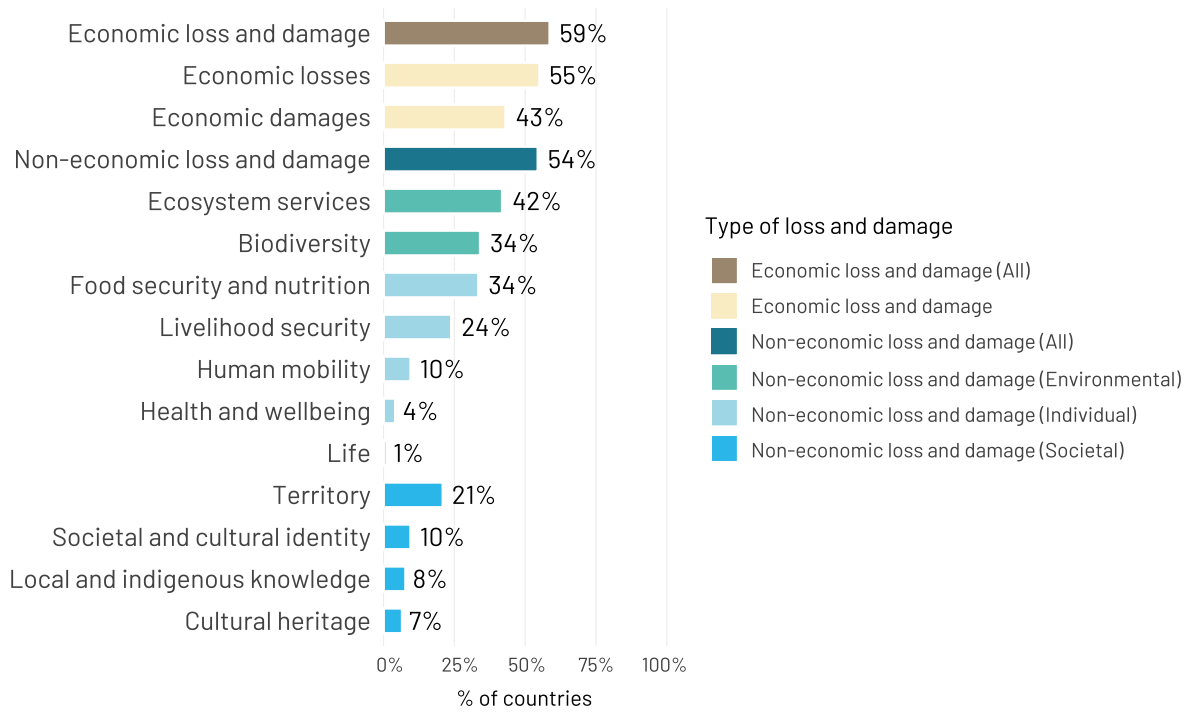
LOSS AND DAMAGE IN AGRIFOOD SYSTEMS REPORTED IN NATIONALLY DETERMINED CONTRIBUTIONS



Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

FIGURE 10

ECONOMIC AND NON-ECONOMIC LOSS AND DAMAGE IN AGRIFOOD SYSTEMS REFERENCED IN NATIONALLY DETERMINED CONTRIBUTIONS, BY TYPE

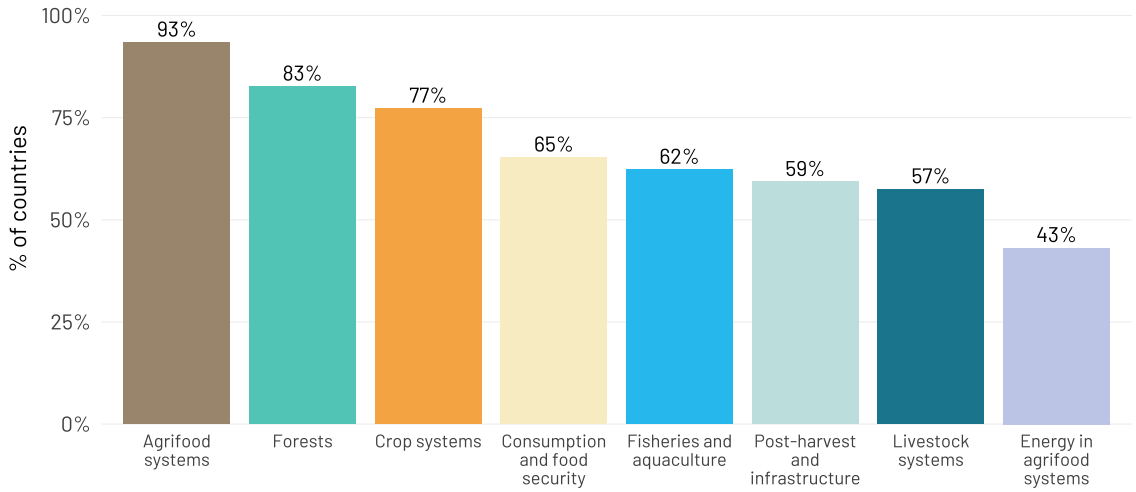


Source: Authors' analysis of NDCs submitted as at 30 April 2026. In the figure, agrifood systems include supporting systems (ecosystems and rural areas).

No. 5 Nearly all countries see adaptation in agrifood systems as a pathway towards resilience: countries reiterated their adaptation priorities for agrifood systems in third-round NDCs (93 percent, compared with 95 percent in previous NDCs). These priorities span all agricultural subsectors and stages of the food system. Building the resilience of surrounding ecosystems and biodiversity (83 percent in both cycles) also remained a central adaptation priority closely tied to agrifood systems (Figures 11 and Figure 13). Addressing the climate impacts on the human or socioeconomic dimensions of agrifood systems and rural areas is also an increasingly prominent adaptation priority (81 percent, compared with 76 percent in previous NDCs). This increase is evident in nearly every region and across every dimension analysed – from livelihoods and poverty alleviation to health and well-being, gender equality and social inclusion (Figure 12).

FIGURE 11

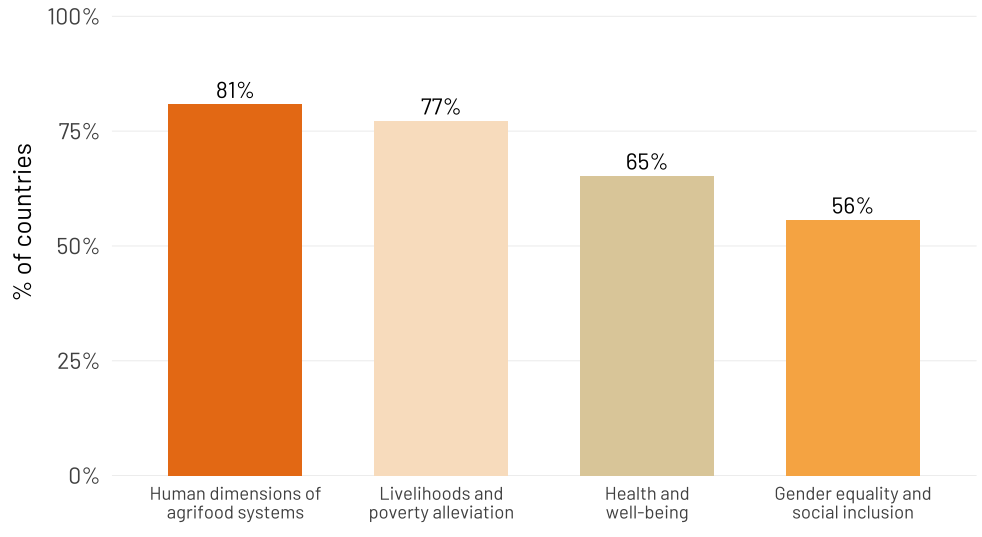
ADAPTATION PRIORITIES IN AGRIFOOD SYSTEMS REFERENCED IN NATIONALLY DETERMINED CONTRIBUTIONS, BY SUBSECTOR



Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

FIGURE 12

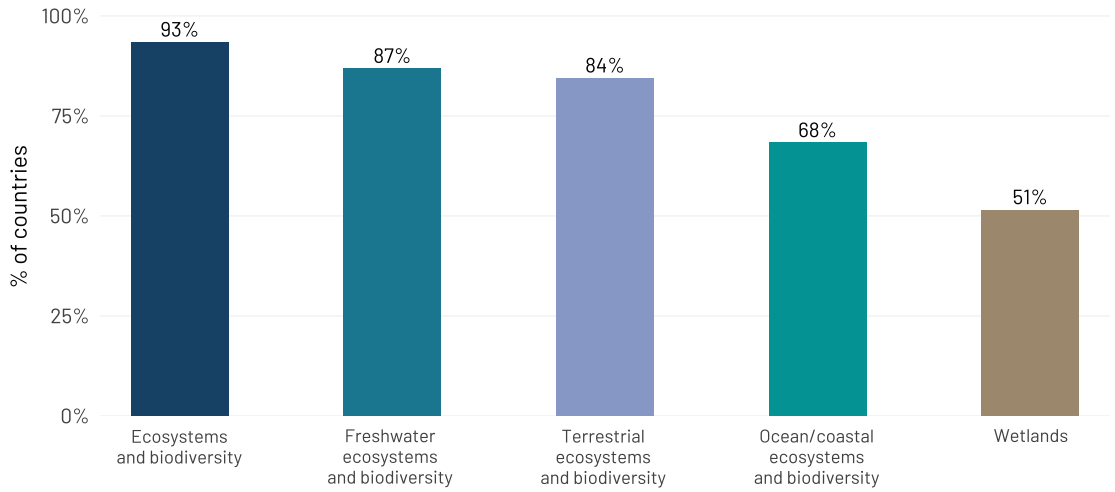
ADAPTATION PRIORITIES RELATED TO THE HUMAN DIMENSIONS OF AGRIFOOD SYSTEMS AND RURAL AREAS, BY DIMENSION



Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

FIGURE 13

ADAPTATION PRIORITIES RELATED TO ECOSYSTEMS AND BIODIVERSITY REFERENCED IN NATIONALLY DETERMINED CONTRIBUTIONS, BY ECOSYSTEM

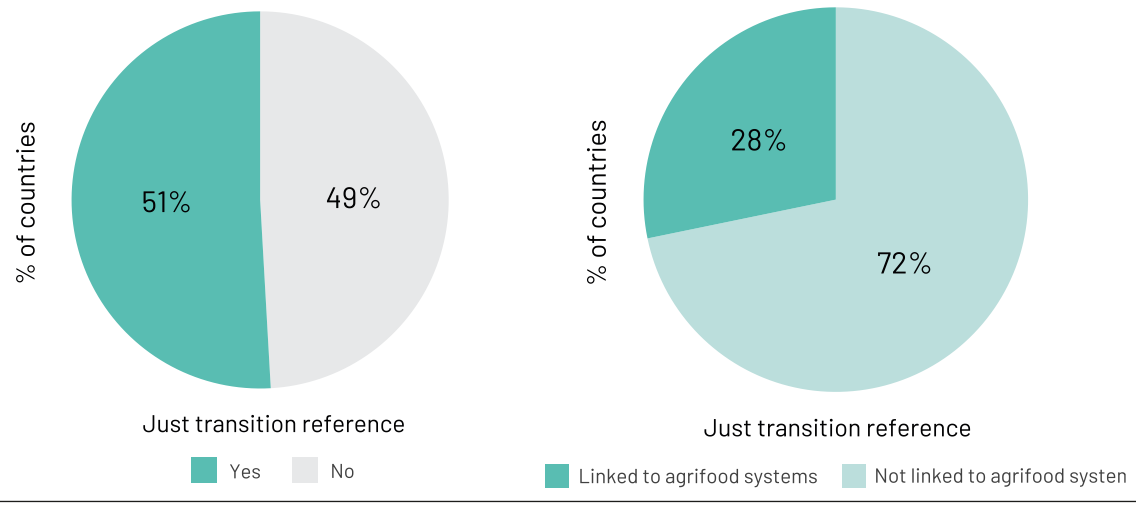


Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

No. 6 For the first time, more than half of all countries embed just transition as a principle underlying NDC planning, but clear linkages with agrifood systems are still nascent. Among countries explicitly referring to just transition in their NDCs, 28 percent establish clear linkages with agrifood systems (Figure 14). Agrifood system pathways are most developed in measures that support vulnerable groups in adopting new climate technologies and practices or diversifying their livelihood opportunities. By contrast, measures addressing power, rights or institutional structures, as well as critical social protection measures – such as social assistance, cash transfers, unemployment insurance, public works, food subsidies and school feeding – remain the least developed areas in the NDCs (Figure 15). This is a missed opportunity to provide smallholder farmers and vulnerable groups with the lifeline necessary to withstand and recover from climate shocks.

FIGURE 14

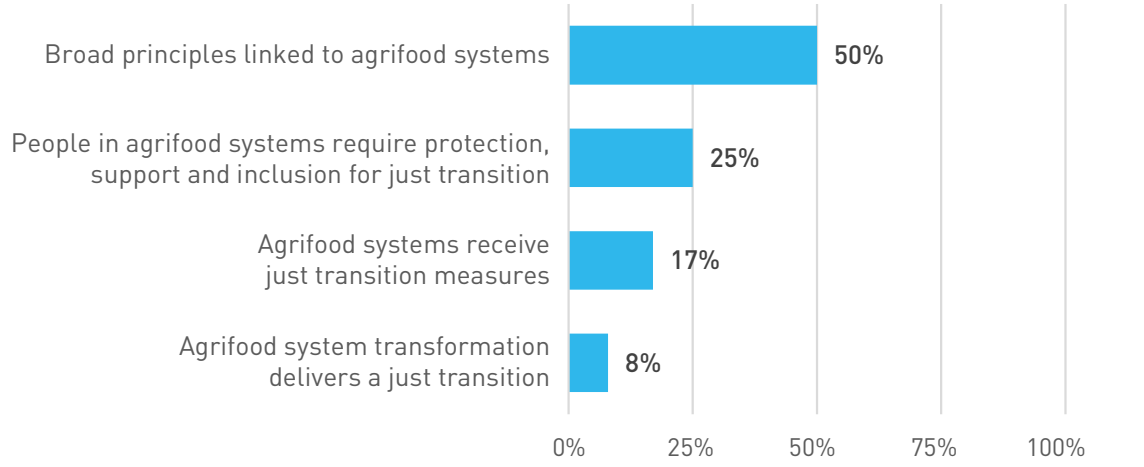
EXPLICIT MENTION OF JUST TRANSITION IN AGRIFOOD SYSTEMS IN NATIONALLY DETERMINED CONTRIBUTIONS



Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

FIGURE 15

KEY LINKAGES BETWEEN JUST TRANSITIONS AND AGRIFOOD SYSTEMS ESTABLISHED IN NATIONALLY DETERMINED CONTRIBUTIONS, BY TYPE

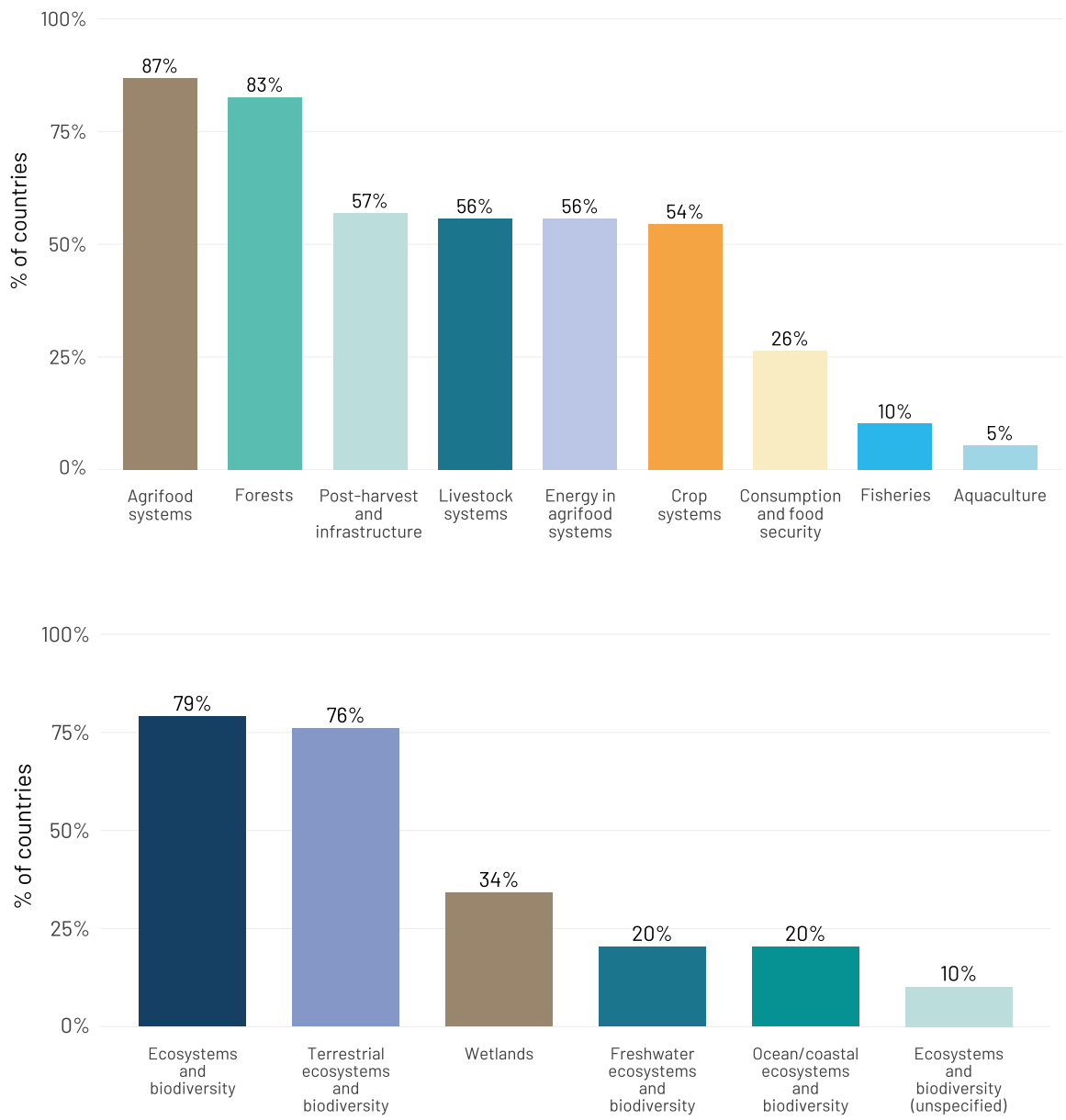


Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

No. 7 Mitigation actions related to agrifood systems were also more prominent in countries' third-round NDCs (87 percent, compared with 77 percent in previous NDCs). They focused more on forests, livestock and crops than on fisheries and aquaculture, with increased attention to the mitigation potential of post-harvest activities and energy use and generation in agrifood systems (Figure 16).

FIGURE 16

PRIORITY AREAS FOR MITIGATION ACTION IN AGRIFOOD SYSTEMS IN NATIONALLY DETERMINED CONTRIBUTIONS, BY SUBSECTOR

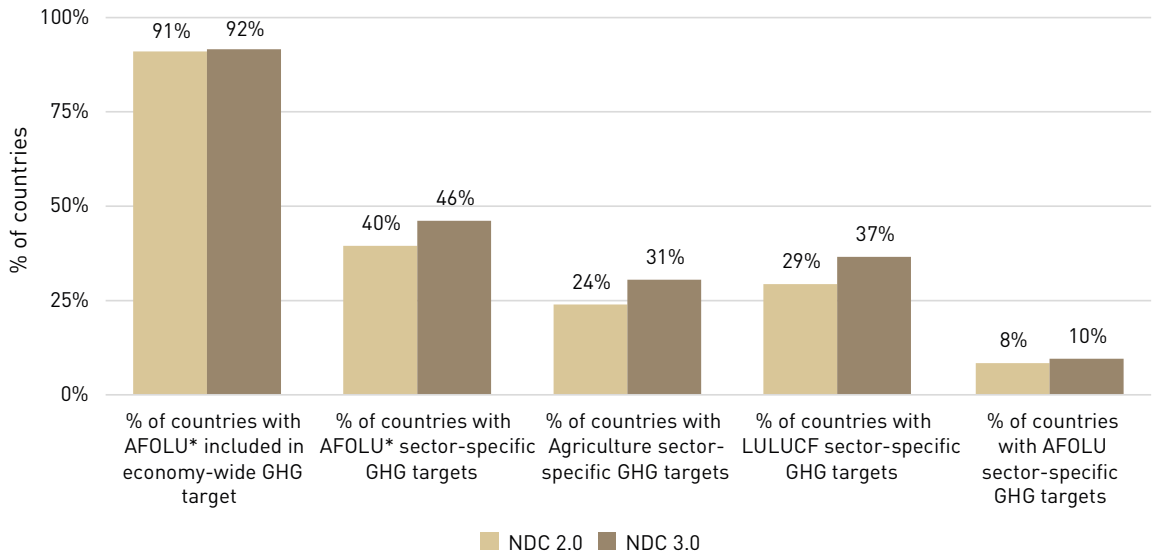


Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

No. 8 Mitigation ambition was also strengthened in third-round NDCs, with more countries incorporating the agriculture and LULUCF sectors into their economy-wide GHG targets and developing sector-specific targets. Globally, 92 percent of countries included the agriculture, LULUCF and/or AFOLU sectors in their economy-wide GHG targets (compared with 91 percent in previous NDCs), and almost half of all countries (46 percent) now have sector-specific GHG targets for agriculture, LULUCF and/or AFOLU (compared with 40 percent in previous NDCs) (Figure 17).

FIGURE 17

COVERAGE OF AGRICULTURE, FORESTRY AND OTHER LAND USE (AFOLU) SECTOR IN GREENHOUSE GAS TARGETS IN NATIONALLY DETERMINED CONTRIBUTIONS, BY TARGET TYPE

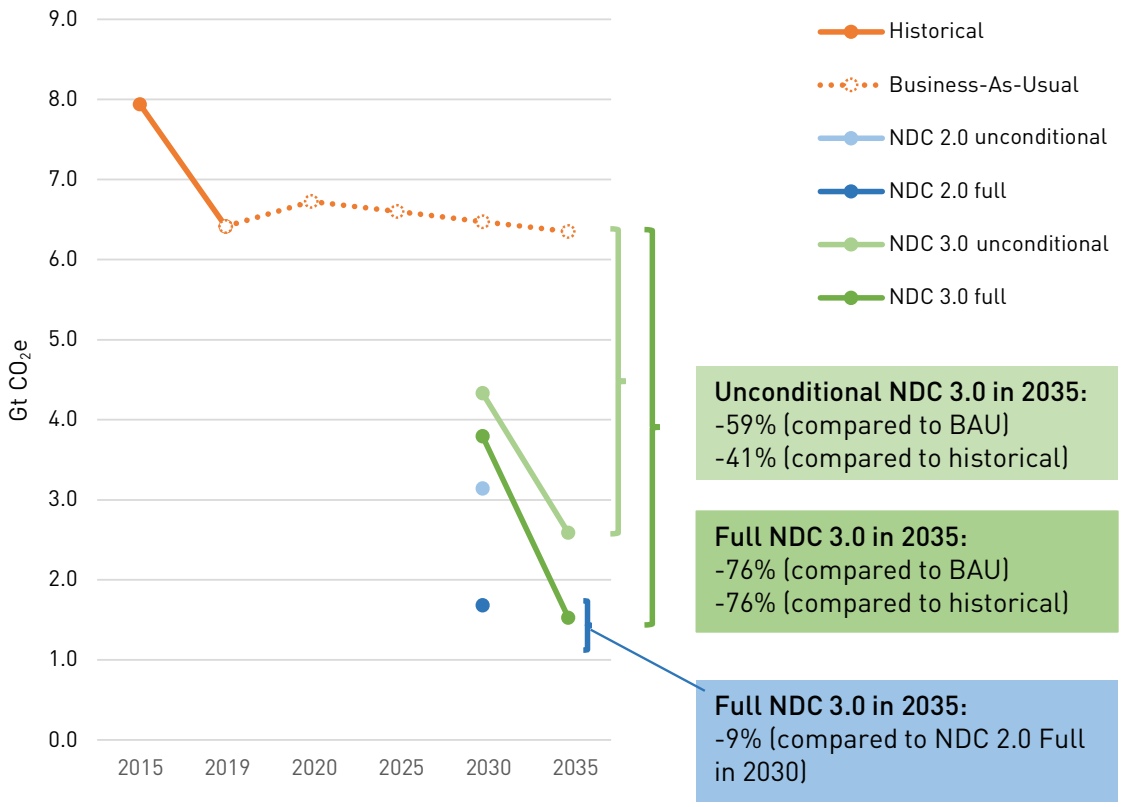


Source: Authors' analysis of latest NDCs submitted as at 30 April 2026. In the figure, "AFOLU" with an asterisk refers to agriculture, LULUCF and/or AFOLU sectoral coverage.

No. 9 The new NDCs lower expected emissions from the AFOLU sector in 2035 by 9 percent compared to previous target levels in 2030. Assuming full implementation of the latest NDCs, including all conditional elements, AFOLU emission levels are projected to reach 3.7 $GtCO_2e$ in 2030 and 1.5 $GtCO_2e$ in 2035, equivalent to reductions of 37 percent and 76 percent, respectively, compared with the corresponding business-as-usual (BAU) levels (Figure 18). Under the unconditional components of the GHG targets alone, total GHG emission levels in the AFOLU sector are estimated at 4.3 $GtCO_2e$ in 2030 and 2.5 $GtCO_2e$ in 2035. These correspond to reductions of 28 percent and 59 percent, respectively, compared with the corresponding BAU levels. If all conditional elements are met, the projected emissions would also be 41 percent lower in 2030 and 76 percent lower in 2035 than in 2019.

FIGURE 18

PROJECTED GREENHOUSE GAS EMISSION TARGET LEVELS FOR THE AGRICULTURE, FORESTRY AND OTHER LAND USE SECTOR BASED ON NATIONALLY DETERMINED CONTRIBUTION TARGETS



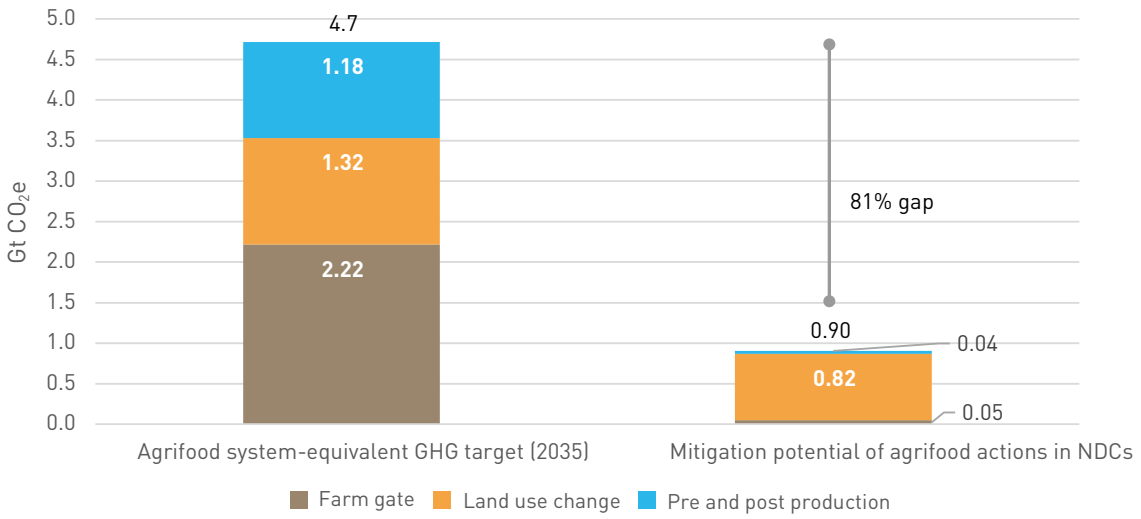
Source: Authors' analysis of NDCs submitted as at 30 April 2026 and national GHG inventory data reported in common reporting tables for 2000–2019 as of 1 June 2026 (or FAOSTAT data downloaded on 1 June 2026). Note: BAU = business as usual.

2.2 GAPS IN NDC PLANNING AND AMBITION LEVELS MAY UNDERMINE EFFECTIVENESS AND IMPACT IN AGRIFOOD SYSTEMS

No. 10 Despite growing ambition, the mitigation actions set forth in the NDCs still do not stack up to meet pledged emission reduction targets, particularly among the 15 highest agrifood system GHG emitters. In total, their proposed mitigation actions account for only 19 percent of pledged GHG emission reductions expected from agrifood systems (Figure19). A cumulative net reduction of 4.7 billion tonnes of CO_2e from agrifood systems would be expected by 2035, based on the agrifood system-equivalent of economy-wide GHG targets stated in the NDCs of these 15 emitters. However, the agrifood-related mitigation actions included in these countries' NDCs have an estimated GHG reduction potential of only 0.9 billion tonnes of CO_2e by 2035. This leaves an 81 percent gap between the proposed mitigation actions and pledged emissions reductions in agrifood systems, suggesting that current NDCs lack clear mitigation action pathways.

FIGURE 19

GAPS IN THE MITIGATION ACTION PATHWAYS OF THE TOP 15 AGRIFOOD GREENHOUSE GAS EMITTERS

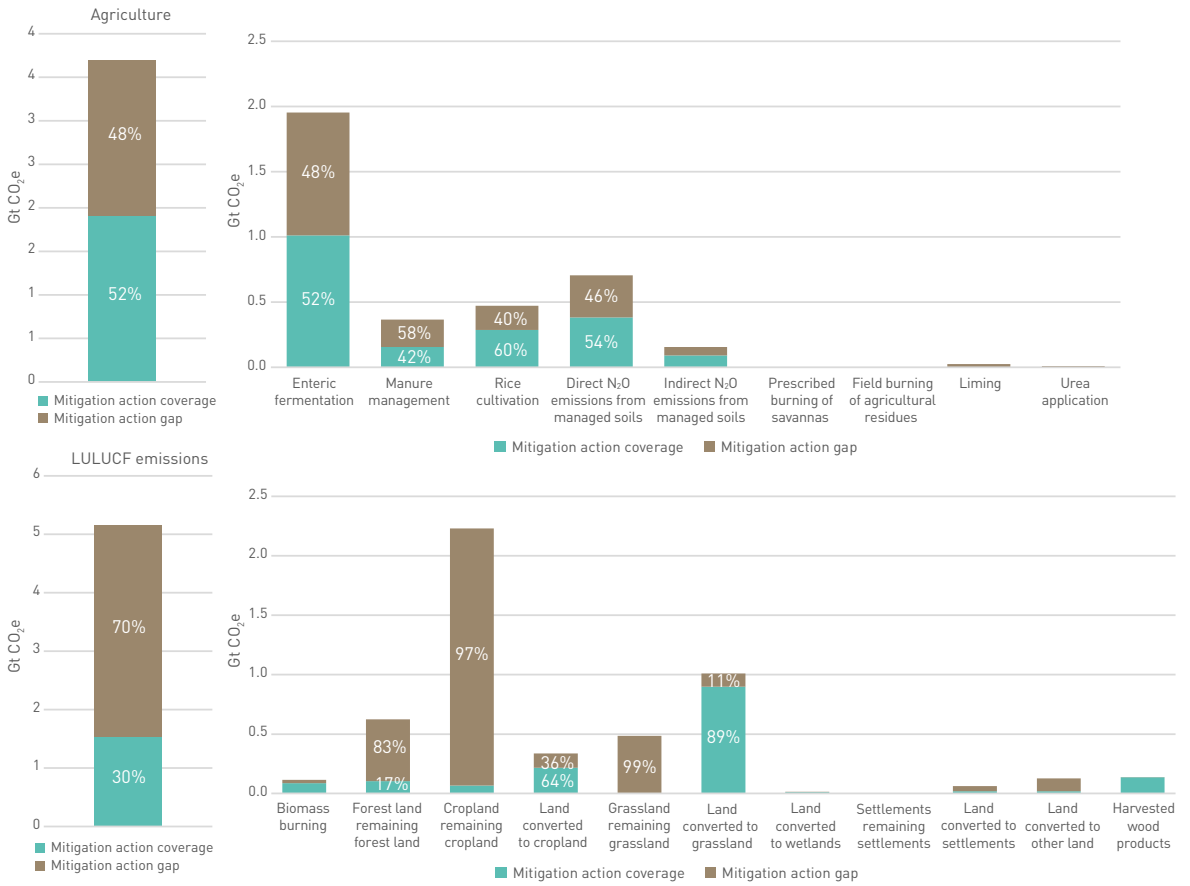


Source: Authors' elaboration of information in the latest NDCs submitted as at 30 April 2026 and FAOSTAT data on 2020–2021 agrifood system GHG emissions totals (FAOSTAT. [Last updated on 28 October 2025]. Emissions totals. [Accessed on 13 May 2026]. https://bulks-faostat.fao.org/production/Emissions_Totals_E_All_Data.zip). Note: This figure presents the difference between the GHG emission reduction implied by the agrifood systems-equivalent of the economy-wide greenhouse gas targets established in the nationally determined contributions and the estimated mitigation potential of actions included (calculated by FAO).

No. 11 Analysis of the entire portfolio of mitigation actions included in countries' NDCs reveals critical gaps in the targeting of key GHG emission categories. In agriculture, the largest mitigation action gaps concern enteric fermentation, direct nitrous oxide (N_2O) emissions from managed soils (e.g. fertilizer application), rice cultivation and manure management. In the LULUCF sector, key emissions from croplands, forest lands and grasslands are also among the least covered. Overall, this equates to 48 percent of agricultural and 70 percent of LULUCF key emissions left uncovered by concrete mitigation actions in the NDCs (Figure 20).

FIGURE 20

MITIGATION ACTION COVERAGE OF KEY AGRICULTURAL AND LAND USE, LAND-USE CHANGE AND FORESTRY CATEGORY EMISSIONS IN NATIONALLY DETERMINED CONTRIBUTIONS, BY EMISSIONS CATEGORY

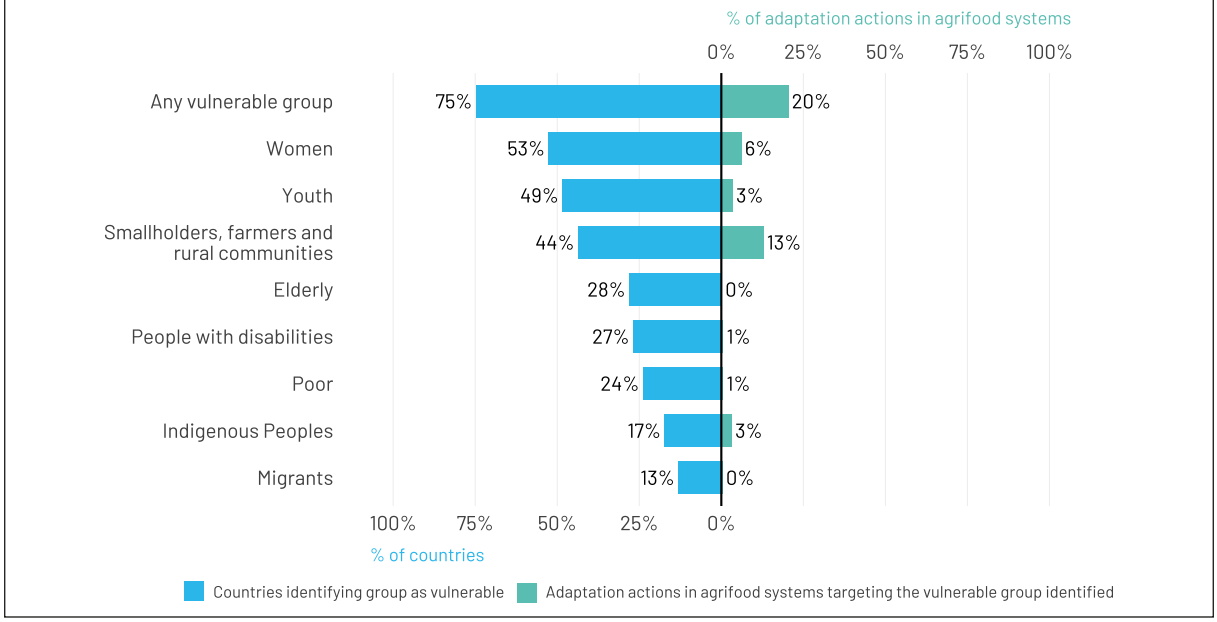


Source: Authors' analysis of 2020 national GHG emissions in common reporting tables of biennial transparency reports submitted as of 1 June 2026 and mitigation actions in the latest NDCs submitted as at 30 April 2026. The figure presents the absolute value (CO_2e) and proportion (%) of key category sectoral emissions that are covered ("addressed") or not covered ("gap") by targeted mitigation actions in the NDCs.

No. 12 The impacts of climate change on agrifood systems and vulnerable groups may be outpacing adaptation planning, resulting in a significant adaptation action gap: 75 percent of countries report impacts on vulnerable groups, with impacts reported on smallholders, women, youth, Indigenous Peoples and migrants nearly doubling across NDC cycles, but only around 20 percent of adaptation actions are designed to address their specific vulnerabilities, capacities and needs (Figure 21). For example, although 53 percent of countries report women as vulnerable to climate impacts, only 6 percent of all agrifood-related adaptation actions in the NDCs explicitly address the differential risks and vulnerabilities women face. This suggests that adaptation options included in the NDCs may need to be tailored more closely to the climate risks and vulnerabilities experienced by different groups within agrifood systems and rural populations. Such tailoring could help make NDC implementation more effective and durable, while avoiding the perpetuation of systematic inequalities and maladaptive outcomes. Similarly, although 86 percent of countries report climate-related hazards in their NDCs (Figure 22), only 22 percent of the agrifood-related adaptation actions mentioned explicitly address those hazards. This matters because different hazards require different adaptation responses.

FIGURE 21

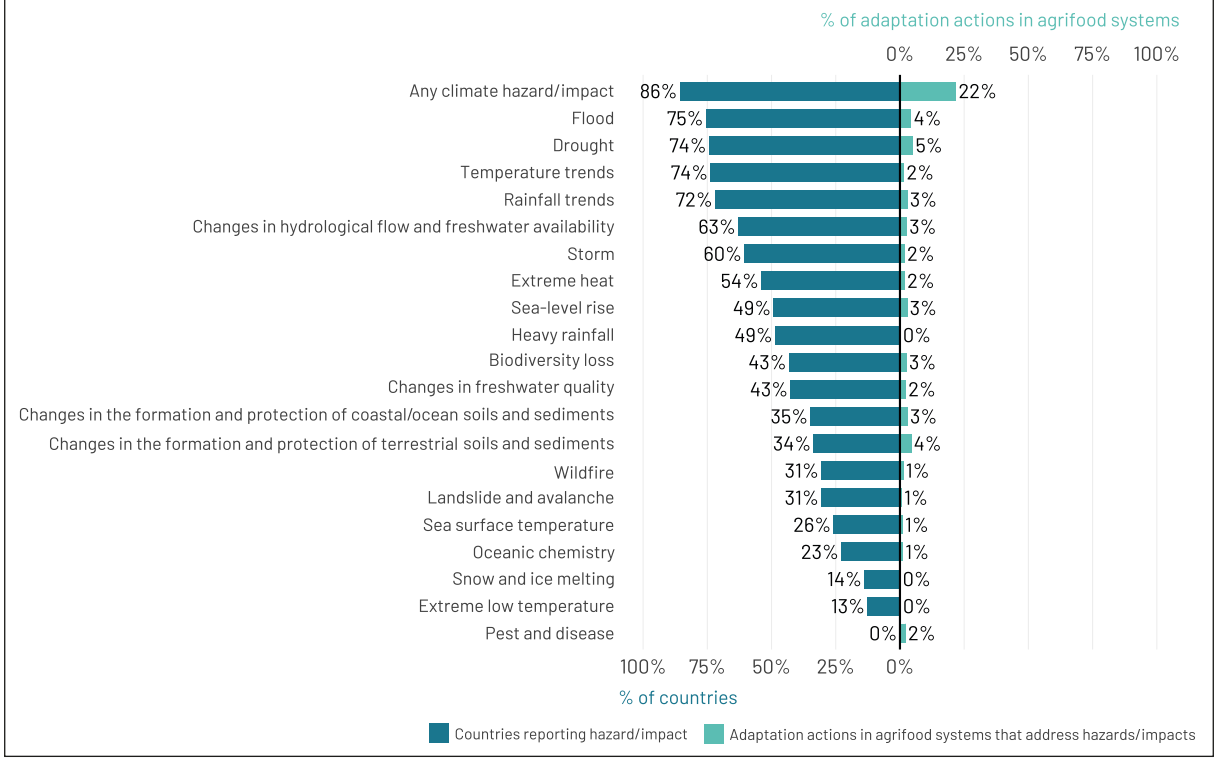
SHARE OF ADAPTATION ACTIONS IN AGRIFOOD SYSTEMS IN NATIONALLY DETERMINED CONTRIBUTIONS EXPLICITLY ADDRESSING IDENTIFIED CLIMATE-VULNERABLE GROUPS, BY GROUP TYPE



Source: Authors' analysis of latest NDCs submitted as at 30 April 2026. Note: the share in the figure's right-side axis is calculated based on the proportion of all agrifood-related adaptation actions in the NDCs targeting the vulnerable group identified.

FIGURE 22

SHARE OF ADAPTATION ACTIONS EXPLICITLY ADDRESSING REPORTED CLIMATE HAZARDS IN AGRIFOOD SYSTEMS IN NATIONALLY DETERMINED CONTRIBUTIONS, BY HAZARD TYPE



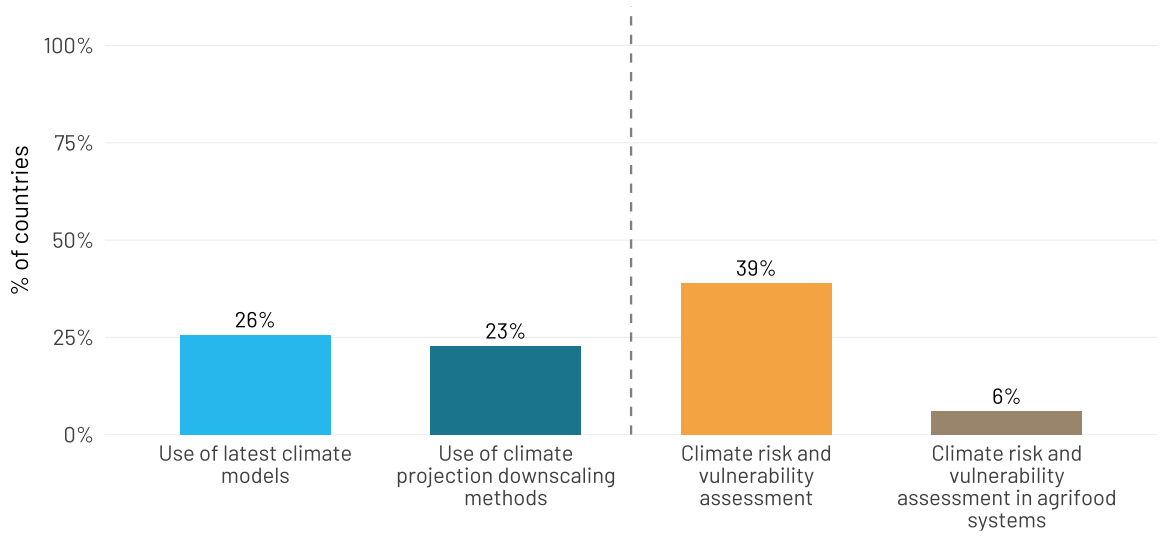
Source: Authors' analysis of latest NDCs submitted as at 30 April 2026. Note: the share in the figure's right-side axis is calculated based on the proportion of all agrifood-related adaptation actions in the NDCs addressing the climate hazard or impact reported.

2.3 COUNTRIES REQUIRE SUPPORT TO BUILD THEIR NDC IMPLEMENTATION READINESS IN AGRIFOOD SYSTEMS

No. 13 Few countries use the latest climate data, downscaled models and applied climate risk and vulnerability assessment in agrifood systems. These underlying data and information gaps (Figure 23) may compromise the evidence base for NDC implementation, which is essential for the design of appropriate, context-specific adaptation strategies. For example, only around one-quarter of countries using the latest climate models (26 percent) or downscaling climate projections (23 percent) and very few conducting climate risk and vulnerability assessments in agrifood systems (6 percent). Similarly, gaps in GHG estimation capacity may limit the design of mitigation actions targeting key sources of GHG emissions in the agriculture and LULUCF sectors (Figure 24). For example, only around half of countries demonstrate higher-tier capacity to estimate agricultural GHG emissions (Figure 24), with stark differences between developed and developing countries.

FIGURE 23

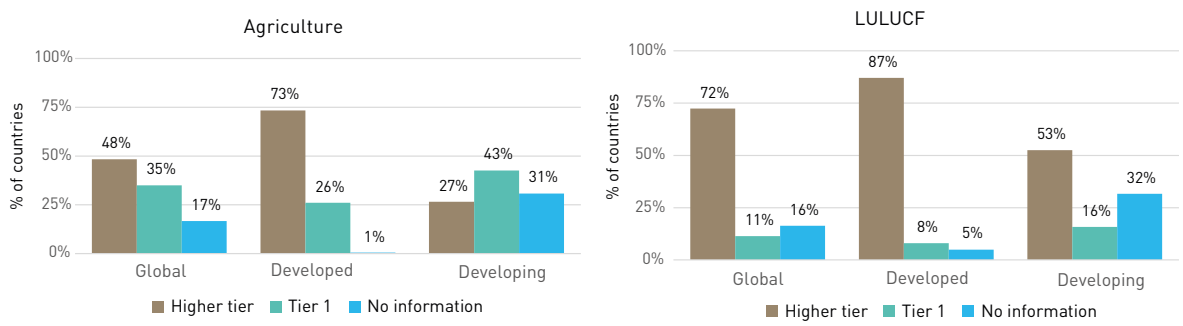
USE OF THE LATEST CLIMATE MODELS, DOWNSCALING METHODS AND CLIMATE RISK AND VULNERABILITY ASSESSMENTS IN NATIONALLY DETERMINED CONTRIBUTIONS



Source: Authors' analysis of latest NDCs submitted as at 30 April 2026. In the figure, the latest climate models refer to countries that reference the use of the Coupled Model Intercomparison Project (CMIP) phases 5 or 6 in NDCs submitted in or after 2021, or reference to the use of CMIP phase 3 in NDCs submitted prior to 2021.

FIGURE 24

CAPACITY TO ESTIMATE GREENHOUSE GAS EMISSIONS IN THE AGRICULTURE AND LULUCF SECTORS, BY TIER AND COUNTRY DEVELOPMENT STATUS

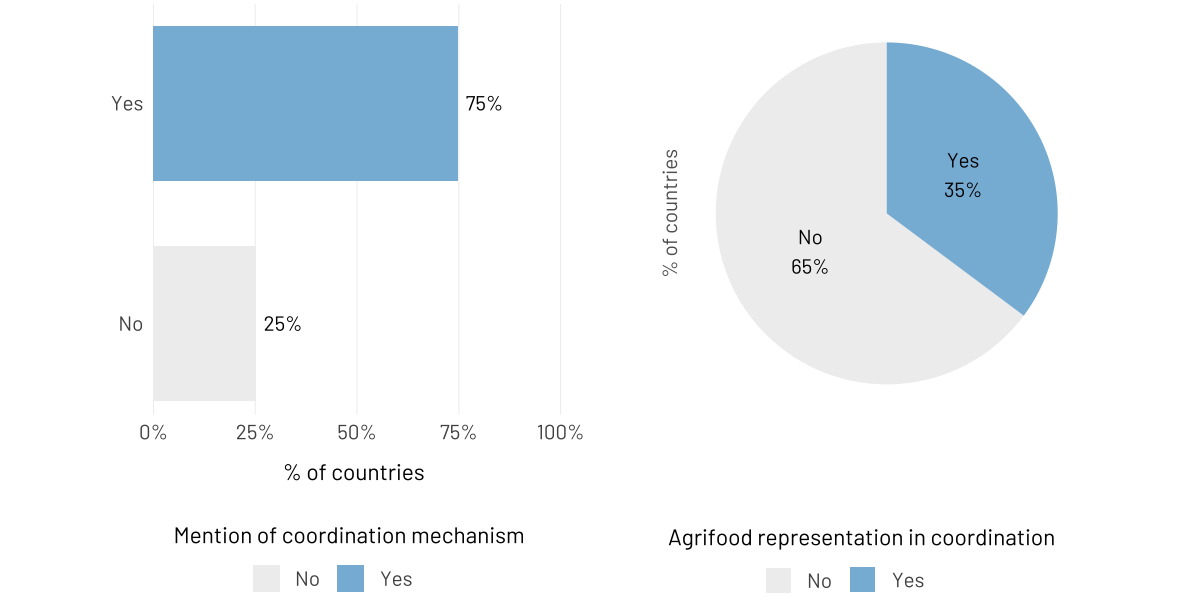


Source: Authors' analysis of latest NDCs submitted as at 30 April 2026. In the figure, the latest climate models refer to countries that reference the use of the Coupled Model Intercomparison Project (CMIP) phases 5 or 6 in NDCs submitted in or after 2021, or reference to the use of CMIP phase 3 in NDCs submitted prior to 2021.

No. 14 Institutional readiness for NDC implementation in agrifood systems is hindered by fragmented governance arrangements and limited participation of agricultural sectors in NDC planning, as well as limited capacity to mainstream NDCs into agricultural sectoral policies, plans and budgets. Based on information in the NDCs, one-third of countries report agricultural sector representation in NDC planning (Figure 25). Less than one-fifth of countries refer to NDC implementation plans in place that cover climate action in agrifood systems, while around one-quarter report having developed NDC financing plans that include the sector (Figure 26).

FIGURE 25

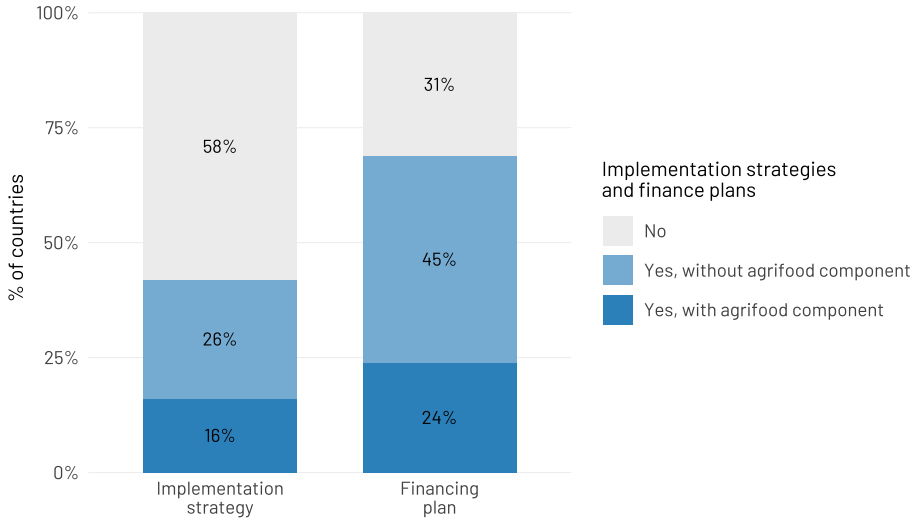
AGRIFOOD SECTOR REPRESENTATION IN CROSS-SECTORAL COORDINATION MECHANISMS FOR PLANNING AND IMPLEMENTATION OF NATIONALLY DETERMINED CONTRIBUTIONS



Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

FIGURE 26

IMPLEMENTATION STRATEGIES AND FINANCING PLANS FOR AGRIFOOD SYSTEMS REFERENCED IN NATIONALLY DETERMINED CONTRIBUTIONS

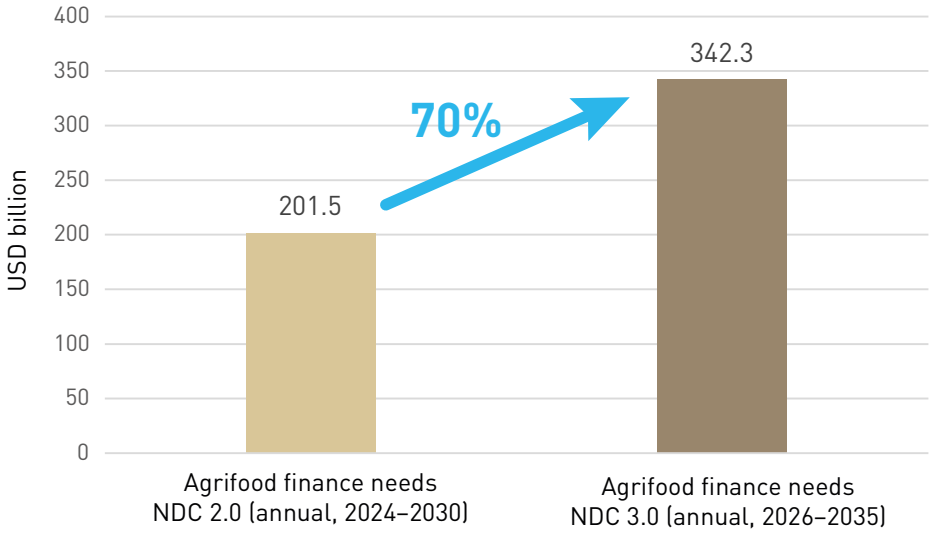


Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

No. 15 While climate finance needs for agrifood systems went up by 70 percent, flows went down. Financing needs for agrifood systems expressed in the NDCs increased by 70 percent compared with the previous round. This indicates potential improvements in the capacity to cost finance needs in the sector, along with the increasing importance of financing for agrifood systems (Figure 27). Overall, agrifood systems account for around one-fifth (18 percent) of total finance needs estimated in the NDCs (Figure 28), rising to 36 percent in low-income countries. Yet crop, livestock, forestry and fisheries production sectors received just 5 percent of international public climate finance flows in 2024 (Figure 29; Caputo *et al.* 2026).

FIGURE 27

CLIMATE FINANCE NEEDS FOR AGRIFOOD SYSTEMS ESTIMATED IN NATIONALLY DETERMINED CONTRIBUTIONS



Sources: Authors' analysis of latest NDCs submitted as at 30 April 2026; Climate Policy Initiative and FAO (2025).

FIGURE 28

AGRIFOOD SYSTEM CLIMATE FINANCE NEEDS AS A SHARE (%) OF TOTAL FINANCE NEEDS REPORTED (2026–2035) IN NATIONALLY DETERMINED CONTRIBUTIONS

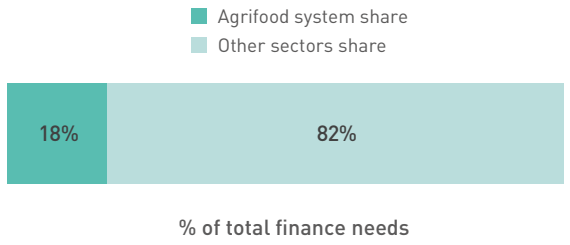
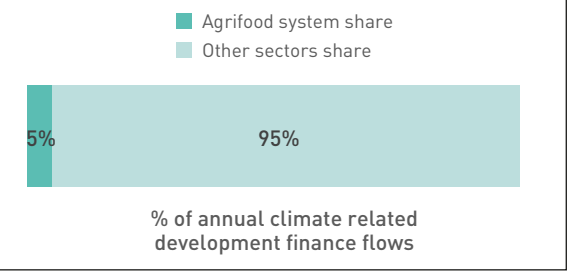


FIGURE 29

SHARE OF TOTAL CLIMATE-RELATED DEVELOPMENT FINANCE FLOWS TOWARDS FOOD-PRODUCING SECTORS IN 2024

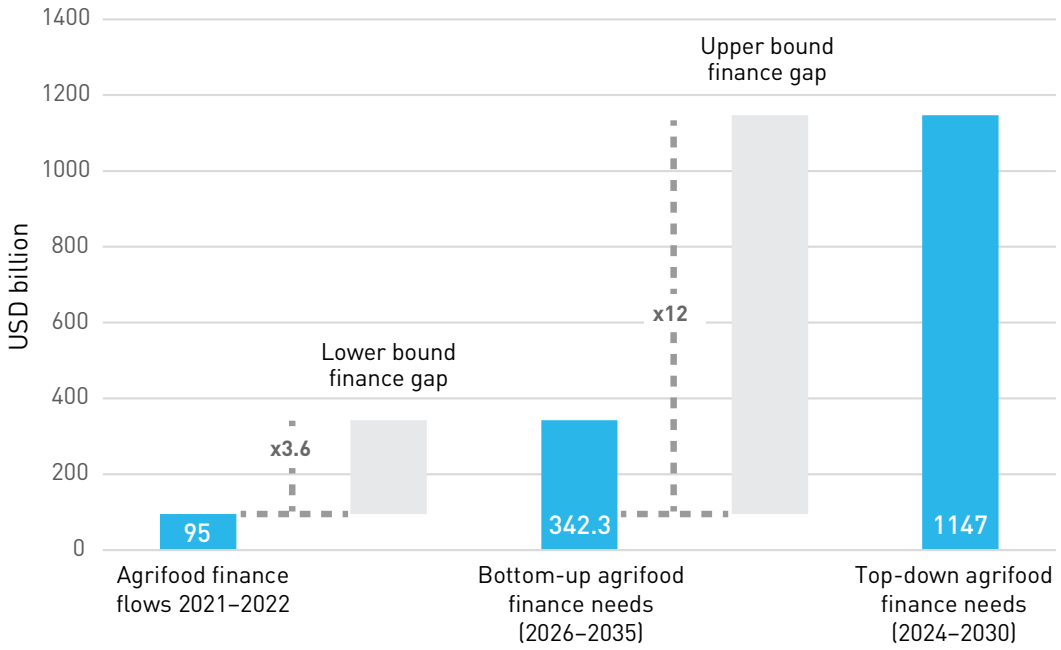


Source: Authors' analysis of latest NDCs submitted as at 30 April 2026 and FAO analysis of climate-related development finance flows (Caputo *et al.* 2026).

No. 16 Climate finance for agrifood systems must increase 12-fold from current levels to meet the most conservative upper-bound estimate of around USD 1 trillion annually. Financing an agrifood system transition aligned with the 1.5 °C goal is estimated to require around USD 1.15 trillion annually through 2030 (CPI and FAO, 2025), while annual climate finance flows averaged USD 95 billion in 2021–2022 (CPI, 2025). This leaves an estimated annual climate finance gap of approximately USD 1.05 trillion (Figure 30).

FIGURE 30

CLIMATE FINANCE FLOWS VERSUS NEEDS IN AGRIFOOD SYSTEMS

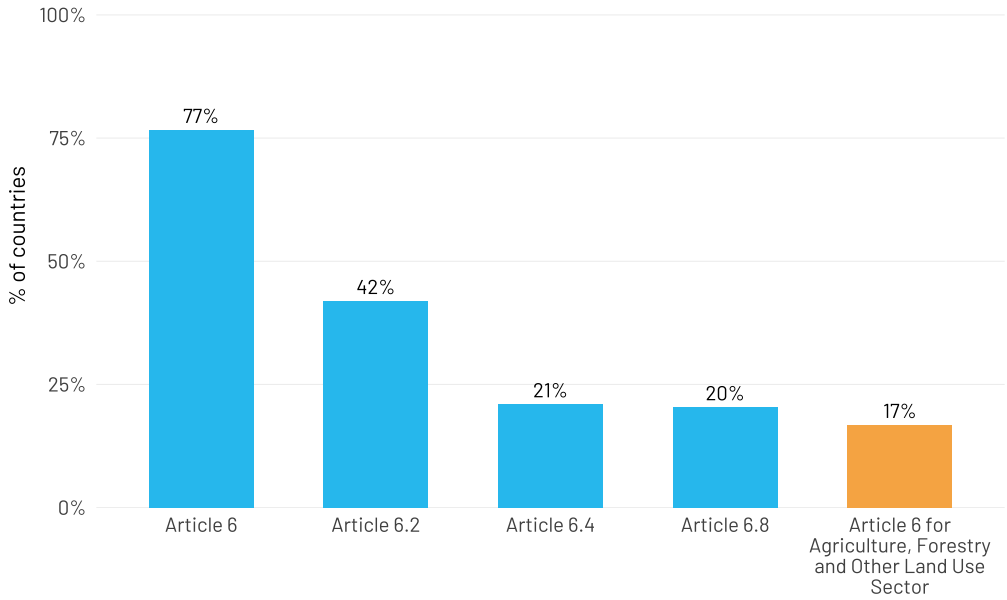


Source: Authors' update to CPI and FAO (2025). The figure presents average annual 2021–2022 climate finance flows from CPI, 2025 (Global Landscape Report), "top-down" annual average agrifood climate finance needs estimated (2024–2030) in CPI and FAO (2025); and "bottom-up" annual average agrifood climate finance needs (2026–2035) based on the authors' analysis of latest NDCs as at 30 April 2026.

No. 17 With public and private climate finance falling far short of what is needed for agrifood systems, countries are increasingly interested in participating in global carbon market mechanisms under Article 6, but readiness levels remain low. Three-quarters of countries (77 percent) express interest in engaging with Article 6 in their NDCs (Figure 31), but nearly 60 percent of those expressing interest remain at an initial stage of readiness or "discovery phase" – that is, without reporting the necessary frameworks, carbon registries or governance arrangements for implementation (Figure 32). This is both an opportunity to tap into new financing opportunities and a challenge to make sure that countries have the necessary institutions, inventories, policies to participate.

FIGURE 31

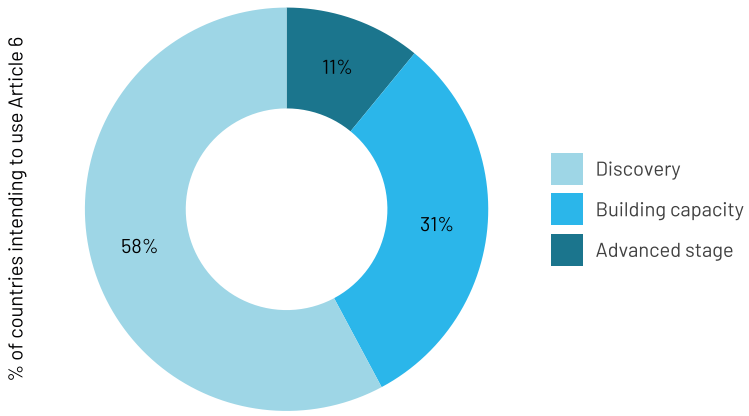
REFERENCE TO ARTICLE 6 MECHANISMS IN NATIONALLY DETERMINED CONTRIBUTIONS



Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

FIGURE 32

ARTICLE 6 READINESS LEVEL EXPRESSED IN NATIONALLY DETERMINED CONTRIBUTIONS

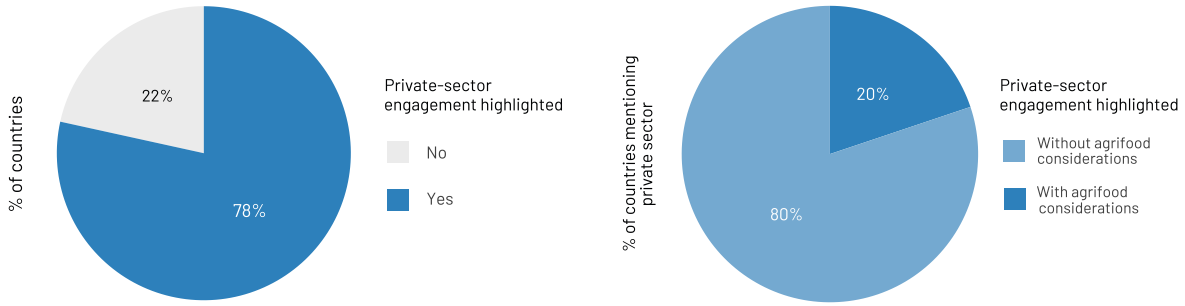


Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

No. 18 Unlocking investment in NDC implementation in agrifood systems will require continued private sector engagement. Three-quarters of countries recognize the private sector as a key player in NDC implementation, but only 20 percent included agrifood system-related private sector actors in the process (Figure 33). Entry points for private sector engagement in agrifood systems identified in the NDCs (Figure 34) focus on forests and the post-harvest stages of agrifood systems, mitigation objectives and the involvement of large cooperations. Greater attention to local private sector actors and small and medium-sized enterprises, especially in the context of adaptation, is also important to ensure that climate action is locally driven, affordable and sustainable over the long term.

FIGURE 33

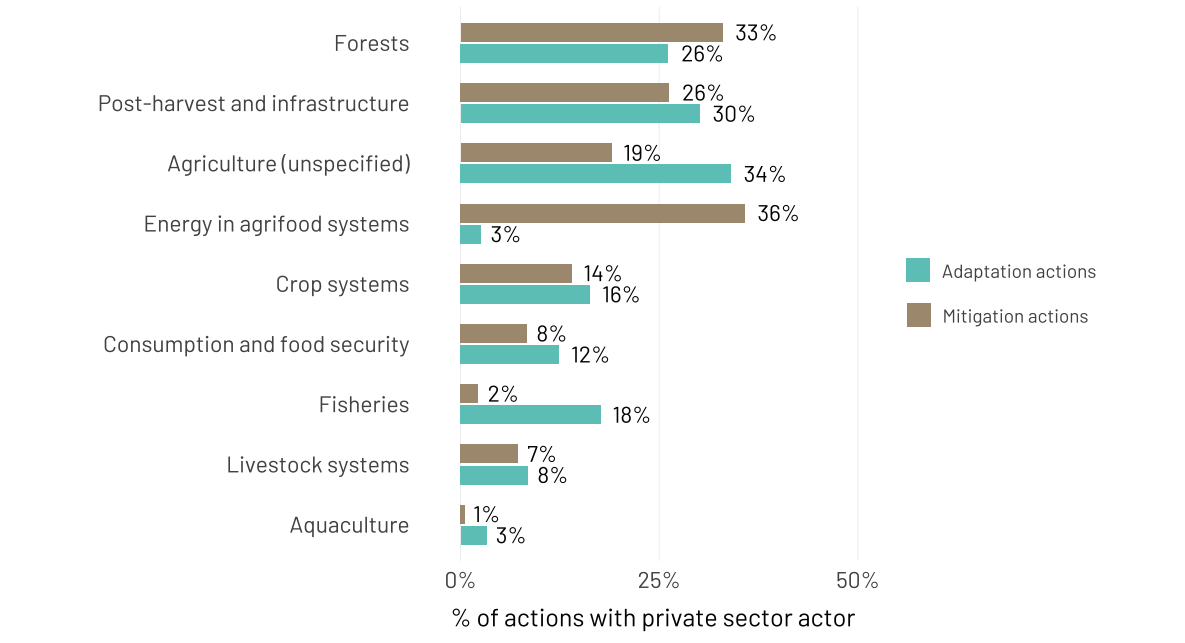
PRIVATE SECTOR ENGAGEMENT IN NATIONALLY DETERMINED CONTRIBUTIONS PLANNING PROCESS



Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

FIGURE 34

ENTRY-POINTS FOR ENGAGING THE PRIVATE SECTOR IN CLIMATE ACTION IN AGRIFOOD SYSTEMS IDENTIFIED IN NATIONALLY DETERMINED CONTRIBUTIONS, BY SUBSECTOR AND CLIMATE OBJECTIVE

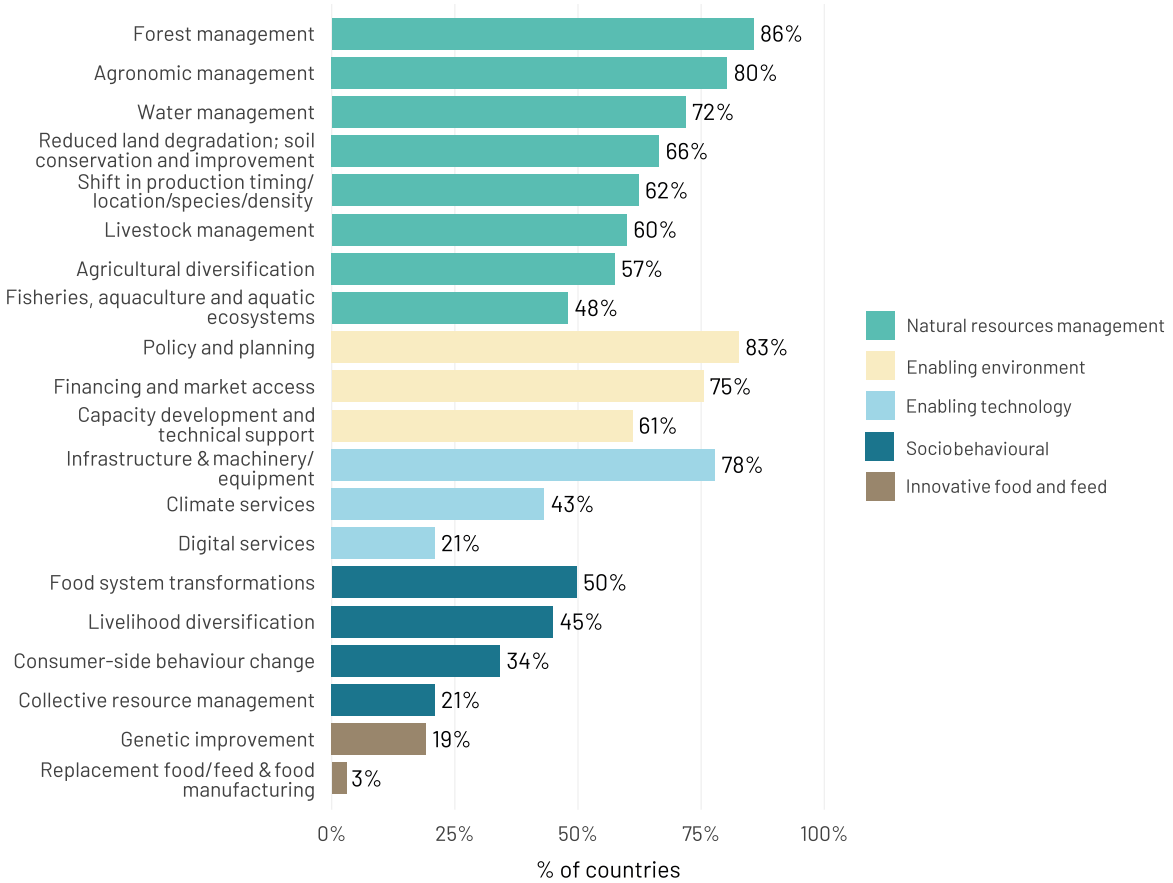


Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

No. 19 Climate technologies for agrifood systems are widely identified as a need in the latest NDCs: natural resource management technologies, enabling environment measures and enabling technologies are most prominent. The latter include digital, mechanical and infrastructure-based solutions that facilitate climate action across the agrifood value chain. In contrast, sociobehavioural approaches, which rely on changes in individual and collective behaviour, social organization and broader system transformations, are predominantly proposed within the adaptation context, while innovative food and feed technologies are rarely included (Figure 35).

FIGURE 35

SHARE OF COUNTRIES MENTIONING CLIMATE TECHNOLOGIES WITHIN THE CONTEXT OF AGRIFOOD SYSTEMS IN NATIONALLY DETERMINED CONTRIBUTIONS, BY TECHNOLOGY CATEGORY



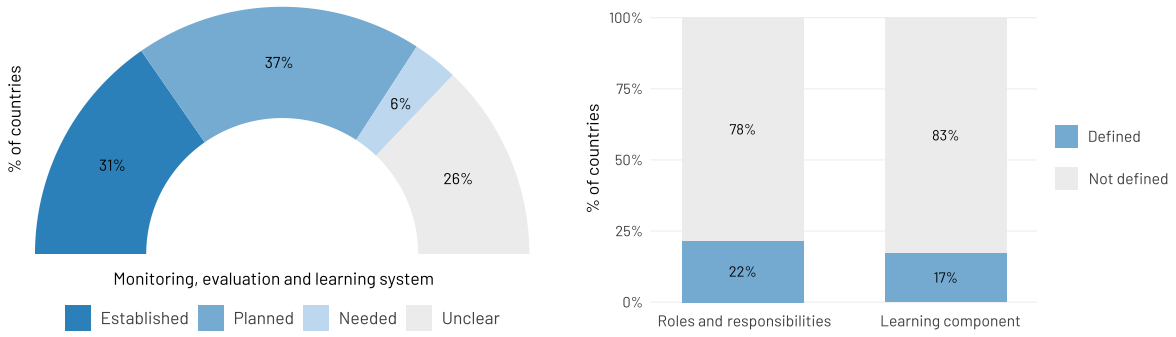
Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

No. 20 Transparency systems for tracking NDC implementation and progress are increasingly recognized as important, but their operationalization remains limited and coverage across agrifood system subsectors and components is uneven: For example, more than half of all countries now include indicators for tracking adaptation in agrifood systems in their latest NDCs (57 percent compared to 45 percent in the previous round). However, these indicators focus on short-term outputs and processes rather than longer-term adaptation outcomes and sustainable development impacts. They also tend to focus on agricultural production rather than downstream food supply and distribution or food security outcomes (Figure 37). The adaptation indicators included in the NDCs are also partially aligned with the Belém Adaptation Indicators (Figure 38), which provide a starting point for tracking progress under the Global Goal on Adaptation's food and agriculture target. However, data systems,

metadata and national capacities to measure progress against each indicator will need further development (Zaidi *et al.*, 2026). Operationalization of monitoring, evaluation and learning systems remains limited: only one-third of countries report having systems in place, according to their NDCs (Figure 36). An increasing number of countries have also developed indicators for tracking progress on mitigation action in agrifood systems (77 percent in the latest NDCs, compared with 61 percent in the previous round), primarily using non-GHG metrics (Figure 39). This illustrates that most countries define indicators in operational terms, such as hectares of land restored or the number of animal breeds introduced, without estimating their mitigation potential (i.e. CO_2e reduced or avoided).

FIGURE 36

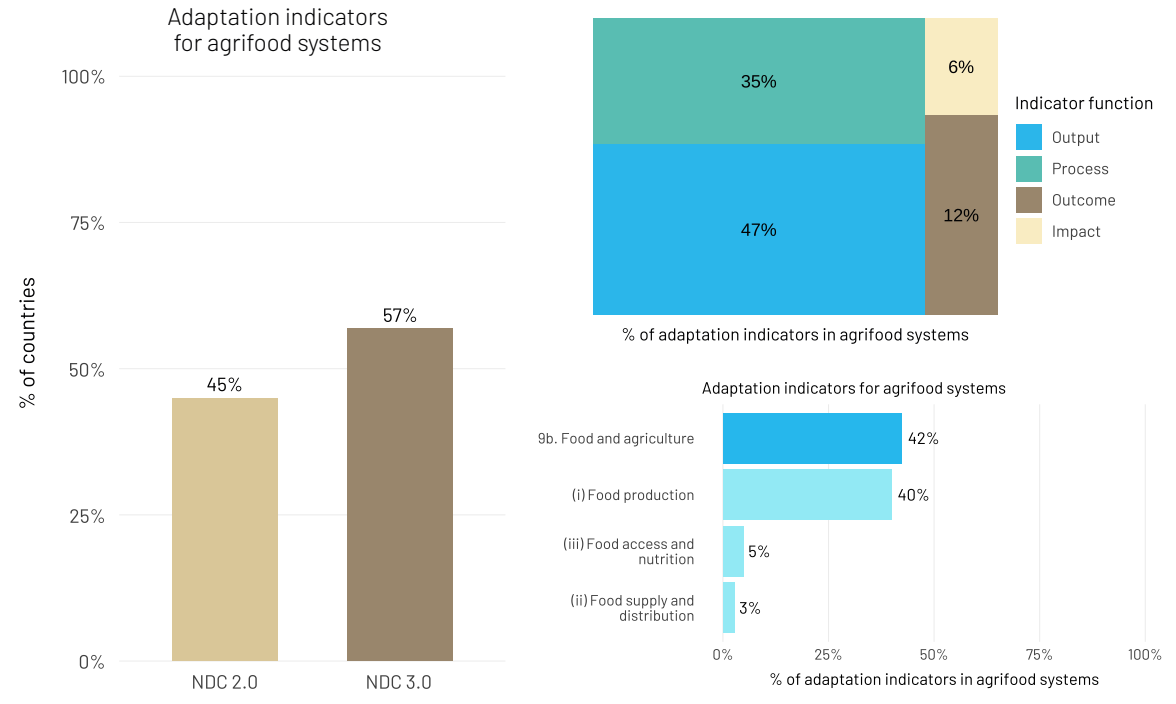
STATUS AND KEY CHARACTERISTICS OF MONITORING, EVALUATION AND LEARNING SYSTEMS FOR TRACKING ADAPTATION REFERENCED IN NATIONALLY DETERMINED CONTRIBUTIONS



Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

FIGURE 37

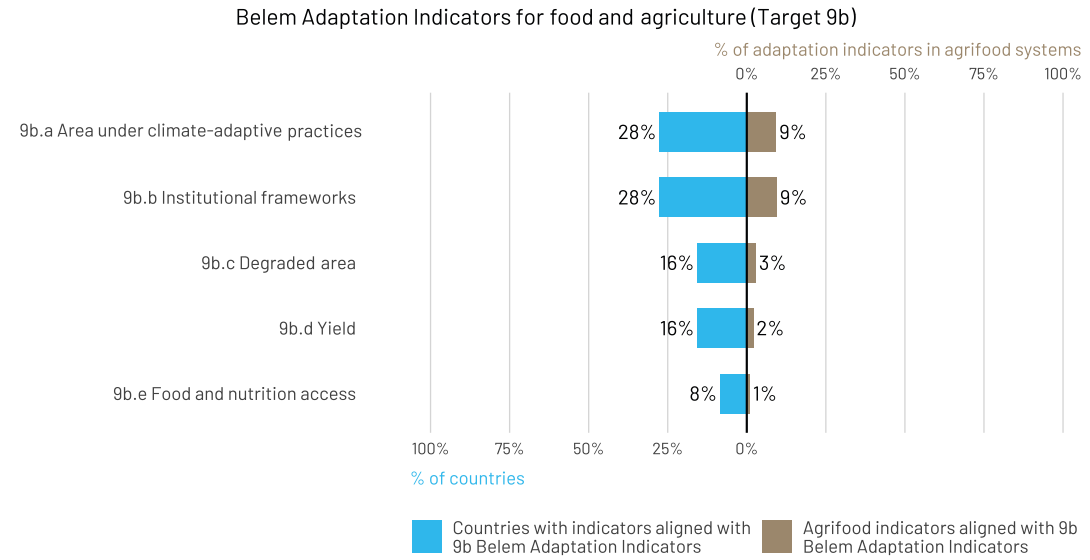
INCLUSION OF INDICATORS FOR TRACKING ADAPTATION IN AGRIFOOD SYSTEMS IN NATIONALLY DETERMINED CONTRIBUTIONS, BY FUNCTION AND COVERAGE OF AGRIFOOD SYSTEM



Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

FIGURE 38

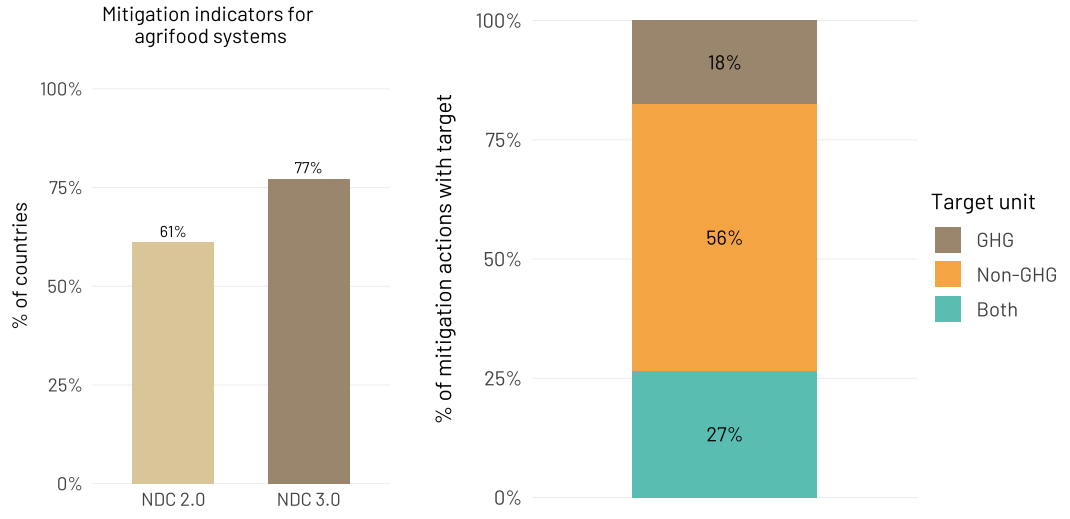
ALIGNMENT BETWEEN AGRIFOOD-RELATED ADAPTATION INDICATORS IN NATIONALLY DETERMINED CONTRIBUTIONS AND THE FIVE GLOBAL GOAL ON ADAPTATION INDICATORS ADOPTED FOR FOOD AND AGRICULTURE



Source: Authors' analysis of latest NDCs submitted as at 30 April 2026.

FIGURE 39

INCLUSION AND TYPE OF MITIGATION INDICATORS FOR TRACKING PROGRESS IN AGRIFOOD SYSTEMS INCLUDED IN NATIONALLY DETERMINED CONTRIBUTIONS



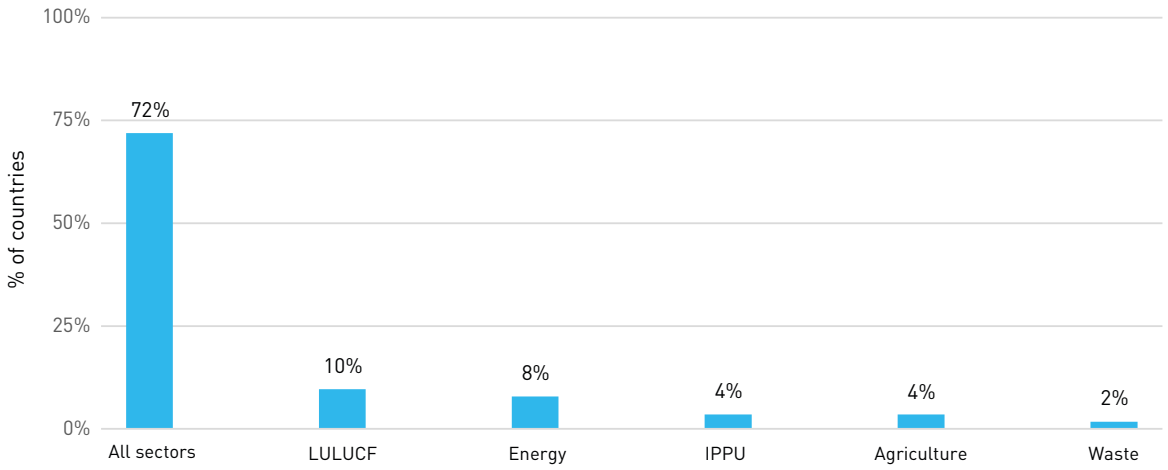
Source: Authors' analysis of latest NDCs submitted as at 30 April 2026. Note: GHG = greenhouse gas.

No. 21 Blind spots in measuring and reporting on NDC implementation progress in agrifood systems may undermine learning and, ultimately, the effectiveness of planned climate action: an analysis of biennial transparency reports (BTRs) finds that reporting on NDC implementation and progress in agrifood systems is limited, especially in developing countries. Among countries with common tabular format tables in the BTRs reviewed, just 4 percent include indicators for tracking mitigation in agriculture and 10 percent in LULUCF, compared with 72 percent reporting indicators across all sectors (Figure 40).

Information on the implementation status of agrifood-related adaptation measures is also limited (Figure 41), with less than one-half of developing countries reporting progress. Furthermore, only 5 percent of countries report in their NDCs having established a knowledge management system or repository to document implementation experiences and lessons learned. Without a clearer understanding of where climate action is progressing, what works and where gaps remain, business-as-usual planning may perpetuate ineffective interventions or, worse, maladaptive outcomes and unintended trade-offs. Learning systems and iterative planning are therefore critical for adjusting NDC planning and improving effectiveness and impact.

FIGURE 40

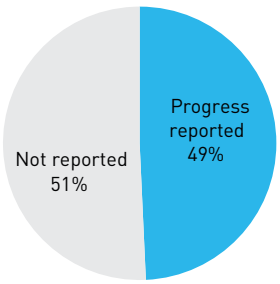
GREENHOUSE GAS INDICATORS INCLUDED IN BIENNIAL TRANSPARENCY REPORTS FOR TRACKING NATIONALLY DETERMINED CONTRIBUTIONS, BY SECTOR



Source: Authors' analysis of common tabular format (CTF) tables (n=114) contained in latest biennial transparency reports (n=133) submitted as of 1 June 2026. In the figure, the proportion is calculated based on the number of countries with CTFs. Note: LULUCF = land use, land-use change and forestry; IPPU = industrial processes and product use.

FIGURE 41

PROGRESS REPORTING ON THE STATUS OF IMPLEMENTATION OF AGRIFOOD-RELATED ADAPTATION MEASURES IN BIENNIAL TRANSPARENCY REPORTS



% of developing countries

Sources: Authors' elaboration of biennial transparency reports submitted (n=69) as of 21 November 2025; Muradás, P., Margiotta, G., Allam, H., Bloise, M., Bernoux, M. & Salvatore, M. 2026. Enhancing transparency for adaptation and loss and damage – Technical insights from the first biennial transparency report submissions. Environment and Natural Resources Management Working Paper, No. 114. Rome, FAO. https://doi.org/10.4060/cd9580en

3. CONCLUSION

The third round of NDCs confirms that agrifood systems are increasingly central to national climate priorities, with stronger commitments to adaptation, mitigation, resilience and social inclusion. However, the analysis also reveals a persistent gap between ambition and implementation: actions are not yet sufficiently aligned with the scale and specificity of reported climate risks, key emissions sources, the needs of vulnerable groups or the finance required for transformation. Closing this gap will require countries and their partners to translate NDC commitments into coherent, evidence-based and adequately financed implementation pathways, supported by inclusive governance, improved data, stronger institutional capacities, fit-for-purpose technologies, private sector engagement and robust monitoring, evaluation and learning systems. Accelerating progress in these areas is essential not only to achieving the goals of the Paris Agreement but also to safeguarding food security, livelihoods and natural resources while advancing climate-resilient, low-emission and equitable agrifood system transformations.



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